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THE EFFECTS OF REGULATION, BANKING DEVELOPMENT AND SELECTED ECONOMIC FORCES ON STOCK MARKET DEVELOPMENT IN AFRICAN COUNTRIES

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Universiti Utara Malaysia

DOCTOR OF PHILOSOPHY
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THE EFFECTS OF REGULATION, BANKING DEVELOPMENT AND SELECTED ECONOMIC FORCES ON STOCK MARKET DEVELOPMENT IN AFRICAN COUNTRIES

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ABSTRACT

Despite the increased number of stock exchanges in Africa, this segment of the financial market remains underdeveloped with low market capitalization, volume, and liquidity. Efforts of the previous policies to promote the stock market development (SMD) and restore the declining investors' confidence did not yield positive outcome as they are yet to meet the rising demand of capital for domestic firms. Building on the Arbitrage Pricing Theory (APT), the main objective of this study is to examine the effects of regulation, banking development, and selected economic forces on stock market development in the 12 African countries using the pooled mean group (PMG) model for the period spanning 1996 to 2016. The findings of the first objective reveal a positive and significant relationship between regulatory quality and SMD. On the other hand, the findings of the second objective indicate a negative and significant relationship between banking development and SMD. While the findings of the third objective suggest a positive and significant relationship between the selected economic forces and SMD. Specifically, life expectancy has a positive and significant relationship with SMD. Secondly, poverty reduction is positively related to SMD. Thirdly, there is a positive and significant relationship between unemployment and SMD while the export growth has a positive and significant impact on SMD. In addition, for the control variables of this study, the exchange rate has a positive and significant impact on SMD while both interest rates and financial crisis exert a negative and significant impact on SMD. The findings of this study have several policy implications that include ensuring a sound and effective securities regulation, promoting a complementary banking sector-stock market development nexus, and ensuring stable economic forces to improve the stock market development in Africa that has been slow in recovering from the aftershock of the 2008 global financial crisis.

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Keywords: arbitrage pricing theory, stock market development, financial crisis, Africa, pooled mean group

ABSTRAK

Walaupun terdapat peningkatan dalam jumlah pasaran saham di Afrika, segmen pasaran kewangan ini masih berada di tahap kurang membangun dengan modal pasaran, jumlah dan kecairan yang rendah. Usaha daripada polisi sebelum ini, bagi mempromosikan pembangunan pasaran saham (SMD) dan memulihkan keyakinan pelabur yang semakin luntur tidak memberikan hasil yang memberangsangkan kerana pasaran saham masih belum dapat memenuhi peningkatan permintaan modal bagi syarikat domestik. Berdasarkan Teori Penentuan Harga Arbitraj (APT), objektif utama kajian ini adalah untuk mengkaji kesan peraturan, pembangunan perbankan dan kuasa ekonomi terpilih terhadap pembangunan pasaran saham di 12 buah negara Afrika menggunakan model *pooled mean group* (PMG) bagi tempoh 1996 hingga 2016. Hasil kajian bagi objektif pertama menunjukkan hubungan yang positif dan signifikan antara kualiti peraturan dan SMD. Sebaliknya, dapatan bagi objektif kedua menunjukkan hubungan yang negatif dan signifikan antara pembangunan perbankan dan SMD. Manakala dapatan daripada objektif ketiga menunjukkan hubungan yang positif dan signifikan antara kuasa ekonomi terpilih dan SMD. Secara khususnya, jangka hayat mempunyai hubungan yang positif dan signifikan dengan SMD. Kedua, pengurangan kemiskinan berkait secara positif dengan SMD. Ketiga, terdapat hubungan yang positif dan signifikan antara pengangguran dan SMD, manakala pertumbuhan eksport mempunyai kesan positif dan signifikan terhadap SMD. Sebagai tambahan, bagi pemboleh ubah terkawal kajian ini pula, kadar pertukaran menunjukkan kesan yang positif dan signifikan terhadap SMD sementara kadar faedah dan krisis kewangan memberikan kesan yang negatif dan signifikan terhadap SMD. Hasil kajian ini memberi beberapa implikasi terhadap polisi termasuk memastikan peraturan sekuriti yang kukuh dan berkesan, menggalakkan hubungan yang salin melengkapi antara pembangunan perbankan dan pasaran saham dan memastikan kuasa ekonomi yang stabil untuk meningkatkan pembangunan pasaran saham di Afrika yang mengalami proses pemulihan yang perlahan selepas krisis kewangan global yang berlaku pada tahun 2008.

Kata kunci: teori penentuan harga arbitraj, pembangunan pasaran saham, krisis kewangan, Afrika, pooled mean group

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LIST OF ABBREVIATIONS

Abbreviation	Full Meaning
ACCA	Association of Chartered Certified Accountants
AEO	African Economic Outlook
AIC	Akaike Information Criterion
APT	Arbitrage Pricing Theory
AREAER	Annual Report on Exchange Arrangement and Exchange Restriction.
ARDL	Autoregressive Distributed Lag
ASEA	African Securities Exchange Association
ASEAN	Association of South East Asian Nations
BERI	Bonds, Equities and Related Instruments
BVRM	Bourse Regionale des Valeurs Mobilieres
CAPM	Capital Asset Pricing Model
CICF	China International Conference in Finance
CMA	Capital Market Authority
CPI	Consumer Price Index
CSE	Cairo Stock Exchange
CaSE	Casablanca Stock Exchange
DFE	Dynamic Fixed Effect
ECT	Error Correction Term
EFI	Economic Freedom Index
EFSA	Egyptian Financial and Supervisory Authority
EIB	European Investment Bank
EMH	Efficient Market Hypothesis
EGX	Egyptian Stock Exchange
EU	European Union
FDI	Foreign Direct Investment
FDS	Financial Development and Structure
FE	Fixed Effect Model
FSB	Financial Service Board
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GSE	Ghana Stock Exchange
IAPM	International Arbitrage Pricing Model
ICRG	International Country Risk Guide
IFS	International Financial Statistics
IMF	International Monetary Fund
IPO	Initial Public Offering
JSE	Johannesburg Stock Exchange
KPMG	Klynveld Peat Main Goerdder
LaSE	Lagos Stock Exchange
LM	Langrage Multiplier
LUSE	Lusaka Stock Exchange
MFM	Macroeconomic Factor Model

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MENA	Middle East and North Africa
MG	Mean Group Model
MGF	Market Guarantee Fund
NAMFISA	Namibian Financial Institutions and Supervisory Authority
NBER	National Bureau of Economic Research
NBS	National Bureau of Statistics
NEPRU	Namibian Economic Policy Research Unit
NILEX	Nile Stock Exchange
NRF	Norton Rose Full Bright
NSX	Nairobi Securities Exchange
NiSX	Nigeria Stock Exchange
NYSE	New York Stock Exchange
OECD	Organization of Economic Cooperation and Development
PMG	Pooled Mean Group
POLS	Pooled Ordinary Least Squares
RBM	Reserve Bank of Malawi
RE	Random Effect
SAIIA	South African Institute of International Affairs
SBC	Schwarz Bayesian Criteria
SEC	Securities and Exchange Commission
SMD	Stock Market Development
STB	Securities Trading Board
SSA	Sub-Sahara Africa
UNCTD	United Nation Conference on Trade and Development
UNDP	United Nations Development Program
USE	Uganda Stock Exchange
VAR	Vector Autoregressive
VECM	Vector Error Correction Model
VIF	Variance Inflation Factor
WAMU	West African Monetary Union
WEO	World Economic Outlook
WFE	World Federation of Exchanges
WGI	World Governance Indicators

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CHAPTER ONE
INTRODUCTION

1.1 Introduction

This chapter as the name implies introduces the background of the study. The chapter also discusses the statements of the research problem. It further presents research questions, research objectives and the significance of the study. The scope of the study is also defined in the chapter, and finally, the chapter presents the organization of the study.

1.2 Background of the Study

Financial markets play a vital role in the growth and development of every economy (Fufa & Kim, 2018). More specifically, the financial market including stock markets play a crucial role in channeling funds from surplus to deficit, from non-profitable to productive sectors of the economy (Suganthi & Dharshanaa, 2014). It is a segment of financial market that provides opportunities for long-term investment. Thus, every nation needs a well-functioning stock market for its development. John and Duke (2013) disclose that equity markets provide channels for mobilization and allocation of funds in economies through exploiting material and human resources for optimal output. Therefore, the importance of stock market in financial economics literature cannot be overstressed. It has been argued that, one of the crucial aspects of research in finance is to understand the cross-sectional behavior of equity market returns (Subrahmanyam, 2018).

Although stock markets assist in the development of economic activities, they are also affected by the conditions of other economic variables. Therefore, capital markets,

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especially in small open economies play a vital role in mobilizing financial resources to achieve greater economic potential (Aliyu, 2012). Moreover, stock markets are organized trading that enables households to trade in shares and other financial securities. Needless to say, however, individuals and firms stand to gain when stock markets are developed through a reduction in cost of trading. Yartey and Komla (2007) assert that stock markets are expected to promote savings by providing investors with additional financial instruments that can sustain their liquidity needs. Therefore, the markets contribute to enhancing the operation of domestic financial system by complimenting the banking sector in supporting investment for economic development.

Similarly, Adjasi and Biekpe (2009), stress that the importance of stock markets is contingent on their impact to nation's growth and development and it benefits consumers and helps in improving the economic condition of nations (Jareño & Negrut, 2016). However, the knowledge about factors that influence stock price will help in developing the market. Previous literature documents a greater percentage of stock market return is explained by other factors that go beyond income and cash flow statement (Trahan & Krantz, 2011).

Despite its essential contribution to financial development, there are critics on the existence of stock markets. Theoretically, Keynes (1936) conjectures that stock markets are mere casinos and avenues that breed speculations. Also, empirically, Bhide (1993) states that liquid stock markets[1] have adverse effects on firm's corporate governance by causing the

[1] A liquid stock market is a market that transactions are quickly and easily executed with many buyers and sellers. Demand and supply changes have insignificant impact on prices of liquid stock.

investor myopia. In addition, it was stated that stock market liberalization escalates income inequality in emerging markets (Das & Mohapatra, 2003) while Agarwal and Mohtadi (2004) note that stock markets mitigate savings and raise investors' uncertainty. Binswanger (2000) states that when stock market bubbles emerge, the asset prices do not correctly reveal economic fundamentals and this irrational behavior hampers the real sector development.

Apart from stock exchanges, the African financial system has financial institutions such as the banking sector, bond markets and the insurance industry that are also less developed in providing finance for investors seeking diversification in the region. For example, the African bond market as an alternative source of long-term finance is not developed for raising capital (Mu, Phelps & Stotsky 2013). It is worth mentioning that the financial markets of many African countries remain underdeveloped with inadequate regulatory framework to monitor and supervise the process of issuing financial securities (Boako & Alagidede, 2018).

In the same vein, banks in Africa are the most dominant financial institutions that facilitate intermediation from surplus to deficit units of the nation's economy. Due to the dominant role of banks, Almutai (2015) states that a country's economy will be adversely affected if the banking industry is not performing well. Despite their dominance, the banking sector is not developed and a good number of households do not patronize the financial service industry. Mbulawa (2015) disclose that a large proportion of African populace still does not make use of the formal financial services while Beck and Cull (2013) note that African

banks are on average the less efficient but more profitable institutions operating in a less competitive investment environment. In a related study, Asiedu and Afful (2014) observe that Africa is one of the most underdeveloped continents because most of the countries are not likely to meet the United Nation Development Program (UNDP) millennium development goals. Asiri and Abdalla (2015) affirm that stock markets provide facilities that allow companies to raise capital at a lower cost and make them less dependent on bank financing.

Additionally, banks are vital financial institutions that facilitates intermediation of funds from surplus to deficit units of nation economy. Recently, Siueia, Wang and Deladem (2019) states that a country's economy will be affected if the banking industry is not performing well. For African continent, unlike other regions, the banking sector is not developed and a good number of people do not patronize the financial service industry. In fact, Mbulawa (2015) states that a large proportion of African populace still does not make use of formal financial services. To be more specific, the ratio of deposit money banks in terms of branches and ATM as proportion to population is far below global average and this is not helpful to the financial system of African countries. Beck and Cull (2013) note that the African banks are on average less efficient but more profitable operating in a less competitive environment.

The banking sector in African countries have very little participation of the private sector in terms of offering credit facilities and other banking services. Allen, Otchere and Senbet, (2010) state that the African banking system mostly invest in government securities like

treasury bills. This reflects a highly dysfunctional banking intermediation that is less concerned on credit to private sector in favor of safer government securities. In a related study, Zajc (2019) reports that the African financial and banking sector remain underdeveloped. In spite of recent reforms taken to strengthen banking sector business in Africa, the banks remain below standard of emerging economies. Although, there have been a considerable improvement in African banking operation, there is still more to be achieved. Fosu (2013) opines that the financial intermediation remains relatively low in most African countries coupled with strong government ownership and traditional banking activities.

Furthermore, the other segments of the African financial system including insurance sector plays a crucial role in the providing the needed financial services to customers. The insurance sector improves the efficiency of other segments of the financial system by enhancing the value of their collateral and reducing losses through credit guarantees[2]. In fact, from the financial investment perspective, the insurance industry is similar to banks and capital markets regarding their services to business units and private individuals (Akinlo & Apanisile, 2014). Nevertheless, the insurance industry in Africa is still in its infancy and is relatively underdeveloped compared to other developing countries (Allen, Otchere, & Senbet, 2011).

However, the African stock markets have gained an appreciable level of progress from the 1980s as a result of financial liberalization programs implemented under the auspices of

[2] Is a promise by a guarantor to assume debt obligation of a borrower if he/she defaults payments.

the World Bank and International Monetary Fund (Quartey & Gaddah, 2007). Although there is a clear intent to promote sustainability among the world's stock exchanges, the African stock exchanges, apart from Johannesburg Stock Exchange, are rarely associated with sustainability (ACCA, 2014). That is, most of the African Stock markets are not developed to be able to offer long-term investment (Dahou, Omar, & Pfister, 2009). In addition, the structural transformation in Africa did not yield a positive outcome because they are not productivity-enhancing fundamental transformations (United nation development program 2011).

Needless to say, Shanken and Weinstein (2006) assert that the financial literature place emphasis on the forces predicting the price of risky assets. Therefore, the predictive strength of economic forces on stock market can help investors make informed decision on their portfolio diversification. This study examines how economic forces (poverty reduction, life expectancy, unemployment, export growth, exchange rates and interest rates) predict movement of stock market in Africa. It was stated that an arrival of information related to economic variables may have effect on stock market returns (Groenewold & Fraser, 1997). Similarly, Ho (2011) posits that understanding the role of economic forces is a bedrock for a successful investment. Hence, investors and financial analysts utilize their ample time studying the trend and information relating to economic forces for future decision making. In fact, stock price changes can reflect changes in investors' expectation about future value of their investment. Mishra and Singh (2011) observe that stock return is a function of future cash flow stream that is highly dependent on market conditions.

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Moreover, the socio-economic factors may have been a major setback to development of the African financial system. It was stated that maintaining stable economic forces is one of the major challenges confronting African region (Addo & Sunzuoye, 2013). Precisely, the persistent level of unemployment and poverty in the continent is having an adverse effect on economic growth hence they are expected to have effect on the overall development of a stock market. A report from the World Bank states that Sub Sahara Africa is a home of at least 30 percent of world poorest people and Africa has six out of the ten most unequal countries in the World (World Bank Group, 2015).

It is worthy of mentioning that the scourge of poverty and unemployment in Africa has ravaged almost all nations in different dimensions (Akwara et al., 2013) while Ojeaga (2014) posits that Africa has the highest ratio of population living below poverty line. In view of this, Castells-quintana and Royuela (2012) observe that when unemployment becomes high and persistent, there are economic costs that can become detrimental to long-term growth. Therefore, the level of poverty and unemployment may have an effect on stock market development through a decrease in nations' aggregate income and investment. The table below highlights the value of private sector credit by banks (banking sector development) and the selected economic forces used in this study.

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Table 1.1
Bank Development and Economic Forces in Africa

Year	BD	PVR	LEP	UN	EXP	EXR	INT
1996	22.96292	6.86766	57.72667	11.08183	30.83993	140.5418	24.59403
1997	25.7019	6.871496	57.57923	10.7005	31.10662	157.6213	22.16076
1998	27.70407	6.886265	57.46177	11.13583	30.36132	175.3544	21.71549
1999	28.63946	6.890438	57.39988	10.87617	30.4416	202.5472	22.37132
2000	29.18161	6.898912	57.43696	11.27175	32.95758	233.457	22.21248
2001	29.5329	6.939253	57.51749	12.17842	33.63586	233.8175	23.14847
2002	27.47428	6.944703	57.70557	11.29633	32.66555	236.2498	21.25029
2003	29.26823	6.969772	57.99023	11.45683	31.66137	236.3076	20.03631
2004	29.88968	6.98658	58.37454	11.17808	31.9335	216.5246	17.17558
2005	30.86802	7.0277	58.85658	11.35783	33.11991	230.0637	16.10916
2006	30.64823	7.061438	59.41629	10.60575	33.75417	220.3571	15.49352
2007	33.40055	7.112302	60.05482	10.74458	33.61428	210.3134	15.1299
2008	36.07851	7.131749	60.72113	11.25158	35.03263	236.7835	14.54843
2009	35.57787	7.181447	61.42921	11.17283	31.53258	232.5739	14.93586
2010	34.42561	7.197771	62.10909	10.48825	32.01399	270.4583	13.89812
2011	35.00465	7.22017	62.77637	11.17808	33.973	289.3259	13.24932
2012	35.59584	7.238354	63.42756	10.93417	33.93818	319.238	14.32035
2013	35.95024	7.25565	63.99291	11.164	31.70116	312.9988	14.97353
2014	36.2018	7.272759	64.50299	11.03958	31.12238	343.7477	14.85297
2015	34.119	7.293854	64.94981	10.78333	29.99679	420.9153	15.17409
2016	35.1092	7.308923	64.96846	10.74433	28.93474	456.2127	15.85202

Source: World Development Indicators, 2016
Note: BD, PVR, UN, EXP, EXR and INT are in rates while LEP is in years.

The second column in the table indicates that level of banking sector development in Africa which is represented by credit to private sector. In other words, the figures capture an important function of financial institutions in terms of channeling savings to investment. Dwumfour (2017) disclose that, households, firms and government approach banks for credit to carry out their operation. Similarly, Agboloyor, Abor, Adjasi and Yawson (2012) assert that the banking sector dominates the African financial system though they are reluctant to lend to private sector due to quest for investment in government securities.

The remaining variables (life expectancy, poverty reduction, unemployment export growth exchange rates and interest rates) are regarded as economic forces in 12 the selected countries of this study. Bodurtha, Cho and Senbet (1989) described economic forces as state variables that can cause changes in stock market return through their effect on expected dividend. Therefore, the knowledge about factors that influence stock price will help in developing the market. Allen *et. al* (2011) posit that a mere creation of stock exchange is of limited value devoid of enabling environment for the smooth functioning of the markets.

The figures of the economic forces variables also confirm the assertion of previous African literature that African continent is bedeviled with a non-conducive investment environment dampening development of the region. To be more specific, the variables in the table above are unstable revealing the true nature of the African macroeconomic fundamentals. This threat is said to have hindered the African stock market from having a brighter future despite the emergence of new stock exchanges (Anyamele, 2013). The harshness of the environment may not be unconnected to the stock markets in Africa are relatively new in origin, finite in operation, low price-earnings multiplier and improper regulatory framework (Solarin, 2011). Asongu (2011) also observes that the African investment environment has been afflicted by investors' inimical suspicions.

To be more precise, the above studies disclose that African region is afflicted by unstable investment environment causing a decline market index. This is not desirable for domestic firms in need of capital for diversification. Zafar (2013) suggest that expansion of

economic activities and currency stability have significant impact on stock market returns. Similarly, Chen and Chiang (2016) posit that stability of economic forces is a necessary precondition for prediction of stock market returns. Since stock market is regarded as an alternative funding avenue for firms, Dahou et al (2009) were of the view that the rise in interest rates reflects a high cost of credit in Africa.

However, it was discovered from literature that weak governance can be a threat to stock market development because the investing environment is not conducive for both domestic and international competition (Iqbal, 2010). Similarly, Milyo (2012) conjectures that a poor institutional quality regarding information disclosure and investors' protection are among other factors contributing to immature stock markets. Yartey (2010) states that stock markets are major channels for foreign capital flows to transition economies while institutional quality enhances the viability of external finance. Therefore, with proper country-specific reforms, the African stock exchanges may exploit their full potential of equity market development.

In a related study, Knack and Keefer (1995) assert that when countries score poorly in governance, it is a strong indication that bureaucracy lacks procedural clarity or technical competence. Likewise, Yartey & Komla (2007) affirm that strengthening of institutions could enhance appeal and confidence in equity investment. Therefore, development of good institutions like enforcement of quality regulation can be a prerequisite for equity market development. In fact, El-wassal (2013) posits that the underdeveloped stock exchanges operate in an unstable investing atmosphere with weak legal framework. This

factors also spread to firms as Eita (2015) discovered that countries with a weak legal framework also have low governance at the firm level.

Despite the financial sector reforms that took place in the African region, most of the stock exchanges are illiquid, small and inefficient[3] compared to global equity market development (Senbet & Otchere, 2005). This may be as a result of poor governance and weak economic fundamentals which may have caused a major setbacks to investment and stock market development. Allen, Otchere, and Senbet (2011) posit that a mere creation of stock exchange is of limited value devoid of enabling environment for smooth functioning of the markets. According to Ahuru and Olaposi (2016) in spite of the reform agenda to open financial market to foreigners, the performance of stock markets in the African countries is below expectation.

Hence, stock markets in emerging economies like the African countries are facing serious challenges regarding market capitalization, volume, and liquidity. Beck, Demirguc-kunt, and Levine (2004) contend that the financial breadth and depth in Africa are the lowest in all regions of the world. Likewise, Allen et al. (2011) note that the African stock markets face serious challenges regarding market depth.

However, investors' confidence is crucial as far as the development of the financial market is a concern as its declines can further have a negative effect on their spending and risk-taking. Therefore, effective and sound financial policies will go a long way in restoring the

[3] An inefficient market is the one where asset prices are at random and do not always reflect their true value. Past events do not have an influence on securities price in an inefficient market.

declining confidence of investors. Sum (2013) has also provided evidence that business and consumer confidence are critical factors that affect stock market returns. The investor's confidence in the African stock market is continuously degrading which may not be unconnected to the traditional barriers of stock market development like the small size, low liquidity and trading. In fact, the challenge for most African stock markets is to increase their liquidity and have sufficient breadth and depth to ensure price efficiency (Hearn & Piesse, 2010).

Furthermore, Njiforti (2015) opine that the global financial crisis of 2008 is one of the major factors that create fear for African investors and has led to a significant decline in their investment in the region. Kale and Akkaya (2016) assert that consumer and investor confidence are two critical indicators of perception and expectation. In fact, the financial crisis has led to a substantial decline in export and foreign investment inflow to Africa with a consequential loss in market capitalization. It is evident that external finance is necessary to augment domestic savings in order to accelerate investment.

Based on previous statistics relating to African stock markets, the World Federation of Exchanges (WFE 2014) report revealed that the Johannesburg Stock Exchange (JSE) is the only African Stock Exchange among the 20 largest stock exchanges globally in terms of market capitalization. Secondly it is more important to note that most African stock markets are highly concentrated which may have exerted a negative effect on their development. For example, based on the African Securities Exchange Association (ASEA,

2014) annual report, the Nigerian Stock Exchange (NSE) has more than 200 listed companies but a third of its value is represented by one company.

Hence, it could be argued that investors always look for a safer environment for capital accumulation since the African stock exchanges seem to be less efficient and more concentrated. Baker and Wurgler (2007) conjecture that the stocks of small and illiquid firms are likely to be prone to broad waves of investor confidence. Thus, investors' confidence is a necessary factor influencing their portfolio investment which is usually affected by market crises and non-conducive environment. Mensah and Alagidede (2017) state that the international portfolio diversification becomes less operative when financial markets are in turmoil.

Additionally, the harsh economic environment induces foreign portfolio investors to divest from Africa. The report of the African Economic Outlook (AEO, 2016) evidently shows that portfolio flows continue to decline with the withdrawal of $52 billion by global investors from the region. Griffith-Jones and Ocampo (2009) view the foreign capital inflow as one of the most important contributing channels for transmitting financial crises from advanced to emerging economies. Thus, the African stock markets that are relatively more integrated to the global economies are adversely affected by the financial crises (Sugimoto, Matsuki, & Yoshida, 2014).

Moreover, the present study presents a comparative analysis of market development between the ASEAN5 and the selected African stock markets in figures 1.1, 1.2 and 1.3

representing market capitalization, the stock traded and turnover ratio respectively. This comparison further uncovers under-development of the African stock market with ratios far below what is obtainable in the other emerging markets. The diagram represents the figures of the market capitalization ratio for Africa and the ASEAN5 stock exchanges:

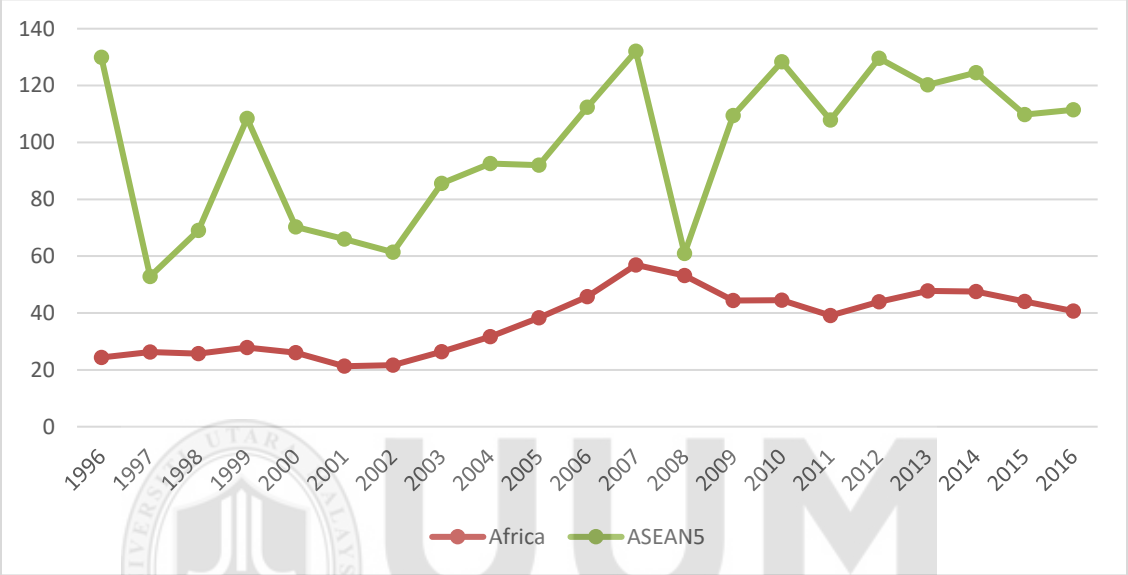

Figure 1.1
The Trend of Market Capitalization ratio for Africa and ASEAN5 Stock Exchanges.

Source: FDS (2016) and WDI(2016) Database.

Figure 1.1 indicates that the average market capitalization (MK) ratio for Africa in 1996 was 35.74 which is far lower than the MK of ASEAN5 that recorded 129.88 for the same year. The figure remains relatively stable from 1996 to 2007 before the global financial crisis that results in a sharp fall of MK ratio from 57.98 in 2007 to about 39.75 in 2008. Thus, the case of African MK is a source of concern considering the under-capitalization of African firms. This could be one of the factors chasing away foreign investors from the region with no sign of significant recovery from the 2008 financial crisis. This further confirms the assertions of previous literature that the African stock exchanges encounter

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serious challenges in terms of market capitalization, turnover and the stock traded value compared to other non-African markets (Ahuru & Olaposi, 2016; Allen et al., 2011). Hence, there is a need for urgent policy reforms to rescue the African stock market from further decline and restore the declining investors' sentiment from the region. In addition, figure 1.2 depicts the average stock traded value for Africa with a comparison to the ASEAN5 figure:

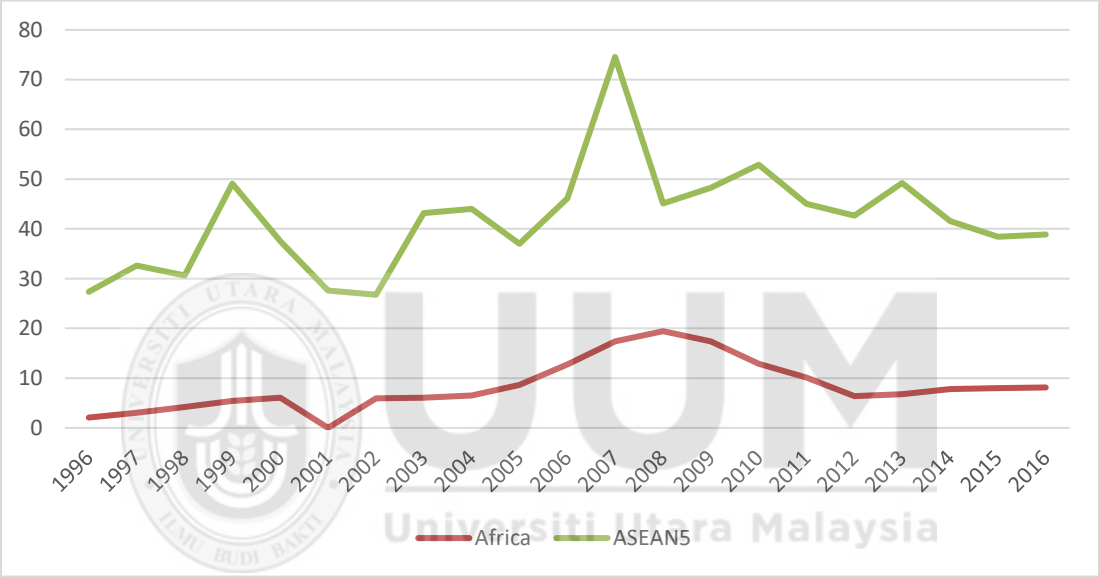

Figure 1.2
The Trend of Stock Trade Value for Africa and ASEAN5 Stock Exchanges

Source: FDS (2016) and WDI(2016) Database

The figure reveals trend of the African average stock traded value in comparison to its ASEAN5 counterpart. Although the figure shows the stock traded value (STV) for African countries is relatively stable from 1996 to 2007, it is far lower than the STV for the ASEAN5 stock markets. The low value could be an indication of low patronage and poor trading in the region's stock exchanges. For example, the figure of the STV in 1996 for Africa was 2.06 while the ASEAN5 figure in the same year was 27.32 representing over

ten times more than the African average. This wide difference indicates a sign of low trading and patronage by the investors to the African region. Consequently, the STV figure for Africa plummets to 15.11 from the 2007 figure of 25.27 during the global financial crisis representing more than 40 percent decline. In fact, the STV figures continue to decline with no sign of recovery up to 2016. This is a serious threat to investment in the African region and is revealing the decline of the investor's participation.

The global financial crisis of 2008 further worsens the low level of stock market development in Africa as low figures are representing poor patronage of the region's financial markets. This would have its negative implication to the entire economic growth of the Africa countries. The continuous decline needs serious and promising policies so that the continent financial market can recover and compete favorably with the other emerging market such as the ASEAN5 region. In addition, figure 1.3 below made a comparison between the turnover ratio for the African stock exchanges and their ASEAN5 counterpart.

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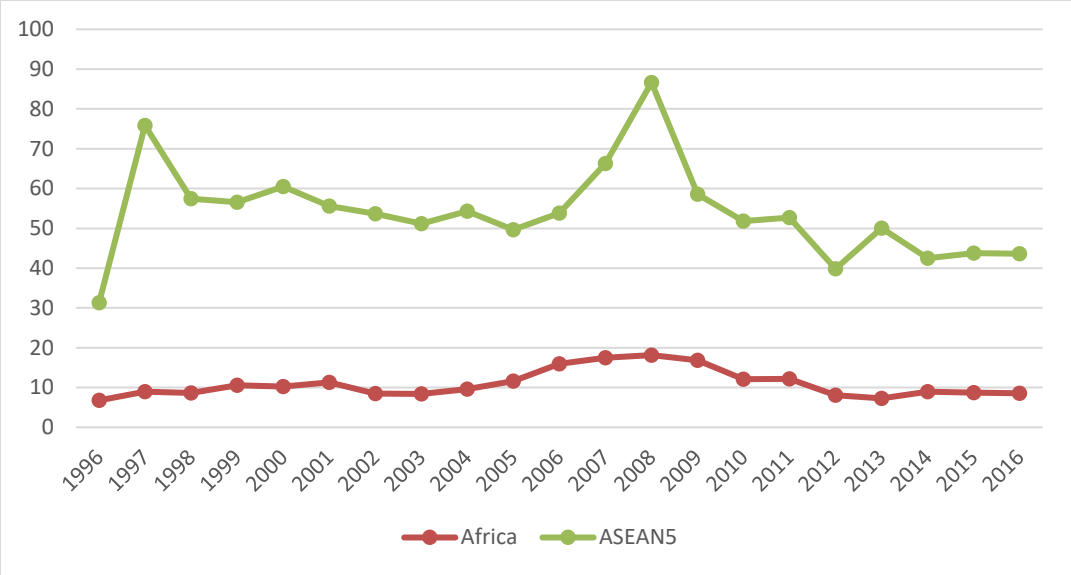

Figure 1.3
The Trend of Turnover Ratio for Africa and ASEAN5 Stock Exchanges

Source: FDS (2016) and WDI(2016) Database

The trend of the average turnover ratio (TOR) for Africa in 1996 was 6.77 which continues to rise that reach its highest point of 18.14 in 2007. However, these indices are lower than the average TOR for the ASEAN5 stock markets. In other words, the ASEAN5 stock markets have been recovering from the aftermath of the GFC compared to the African indices. In other words, from the beginning of the financial crisis in 2008, the Africa STV continues to descend with no sign of significant recovery. This is a major source of concern to the international portfolio investors seeking diversification opportunities on the African stock markets. These factors create uncertainty in the minds of investors and if not addressed will further aggravate its threat on the African investment.

Beck et al. (2011) observe that the African capital markets experienced a rapid decline in capital flows which dampens the stock market indices and constrained government and

firms to cancel bond and stock issues. Similarly, the trend confirms the findings of the prior literature that African region faces serious challenges regarding market size, volume and liquidity which makes it difficult if not impossible to provide long-term financing (Adjasi, Biekpe, & Osei, 2011; Hearn & Piesse, 2010; Smith & Dyakova, 2014).

Nevertheless, the financial crisis of 2008 was originated from the United States, it spreads to almost all nations with varying degree of damages to the economies. Iqbal (2010), states that developing economies are not responsible for the origin of the financial crises but are seriously affected through channels of trade and finance. Similarly, Ali and Afzal (2012) affirm that the net capital inflow from the advanced to the emerging nations decline significantly from the beginning of the crises.

1.3 Statement of the Problem

The persistent low development of the African stock market is a strange scenario which demands urgent attention. Although stock markets of emerging economies including the ASEAN5 recovered from the 2008 global financial crisis and continued to flourish, the African stock markets development indices kept declining with little sign of recovery. This strange behavior that needs an urgent response from the academic world to investigate the possible factors hindering the African stock exchanges to recover from the aftermath of the global financial crisis.

In addition, there is a slowdown of economic activities in the African region and a significant reduction in foreign investment with investors moving out of the region. These factors may have resulted to decline in investors sentiment to the African stock market and

needs urgent attention. Figure 1.4 depicts the trend in the level of economic activities in Africa.

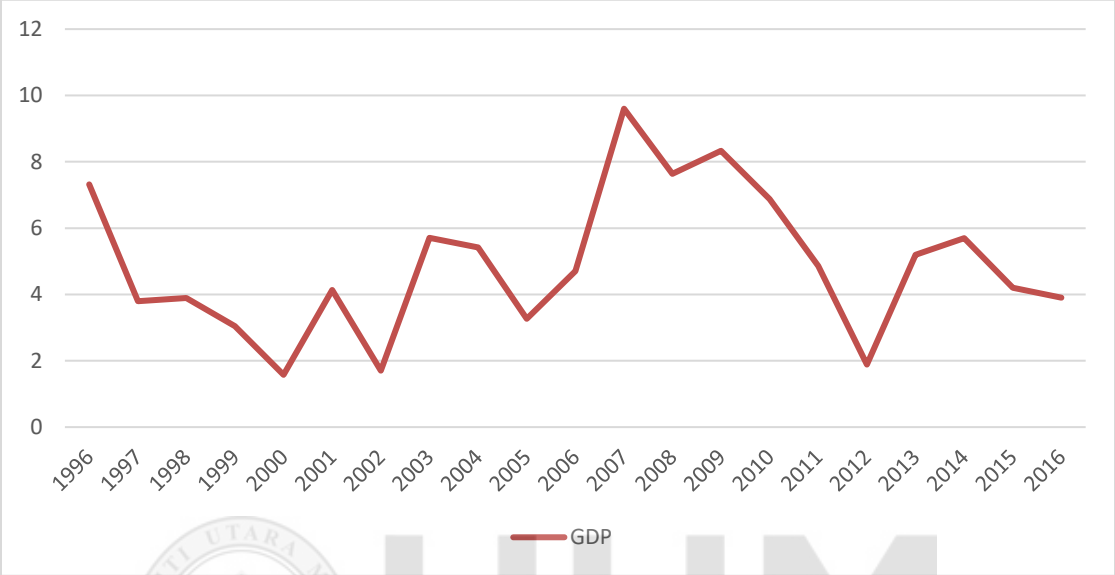

Figure 1.4
Trend of African Gross Domestic Product Per capita

Figure 1.4 reveals the annual growth of gross domestic product for the 12 African countries. As shown, the level of GDP has been unstable and on a declining trend up to 2016. This is in line with the assertion of Trahan and Krantz (2011) that stock market activities reflect the strength of nation economy as advanced nations have a well-developed stock market. In other words, the strength of economies can be mirrored through their stock market. In terms of level of foreign investment to the African region, Figure 1.5 depicts the trend of the foreign direct investment inflow to Africa.

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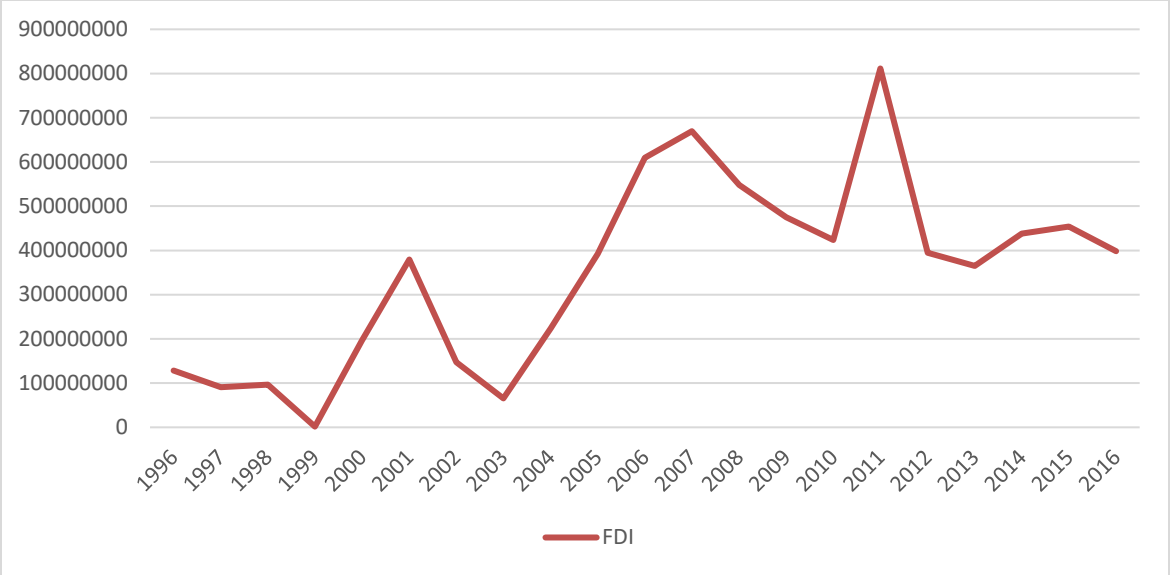

Figure 1.5
Trend of Foreign Direct Investment Inflow in U.S Dollars

Despite foreign direct investment (FDI) was considered as a major form of financing in developing countries (Malikane & Chitambara, 2017; Agboloyor Abor, Adjasi & Yawson, 2012), Figure 1.5 disclose fluctuation and decline in FDI inflows to the 12 African countries. The decline indicates withdrawal of capital by the global investors in the region. This is an indication of change of investors perception on the African continent. In fact, the sharp decline may not be unconnected to the uncertainty on investment environment and fall in equity prices. There is need for a concerted effort and policy framework to provide a conducive environment for efficient utilization of untapped investment opportunities.

It was disclosed that the African region has a diverse financial system that is economically underdeveloped with enormous untapped investment opportunities (Allen et al., 2011; Ibrahim & Alagidede, 2017). Nevertheless, the African region has been less considered in

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the extant literature on how to improve the performance of stock markets. There is a need for policy framework that makes African market more attractive to foreign portfolio to support investment opportunities in the region.

Despite the crucial global role of stock markets in financing and developing business activities, it has not been given priority in Africa. In other words, the equity markets in developed nations are used as a medium for obtaining long-term financing while the African stock markets face serious challenges regarding their market capitalization (size), liquidity and a trading volume. Consequently, most of the stock markets are small, illiquid and their market capitalization is mostly dominated by few firms (Ngare, Nyamongo & Misati, 2014).

It is worth emphasizing that the slow recovery of the African stock market from the 2008 financial crisis is the major motivating factor for conducting the present study. In a related study, Seck (2017) states that the African stock markets would have been the best investment destination prior to the global financial crisis that caused a devastating effect on their development. However, the decline of stock prices implies decreasing returns, underperformance and divestment by investors (Adjasi & Biekpe, 2009). This signifies that investment risk factors are significant in explaining variations in the stock market while investment decision is generally taken under risk associated with the probability of getting a return (Urbšienė, Bugajevas, & Pipiras, 2016).

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Therefore, the global financial crises and unstable economic fundamentals become a major source of concern to the international portfolio investors seeking diversification opportunities on the African continent. These factors create uncertainty in the minds of investors and little effort to address them can further aggravate the adverse effect on the African portfolio diversification. Beck, Demirguc-kunt, and Levine, (2010) observe that the African capital market experienced a rapid decline in capital flows which dampens the stock market indexes throughout the continent and constrains the government and firms to cancel bond and stock issues. Hence, an uncertainty generally intensifies economic disorder and thus heightens stock market investment risk[4] (Tsai, 2017).

Additionally, the report from the African economic outlook (2016) reveals a drastic fall in the foreign portfolio investment to the African continent where the foreign portfolio investment has declined with the global investors' withdrawal of $US52 billion. This sharp divestment might due to inconsistent economic policies that continue to send a bad signal to both domestic and foreign investors. This situation calls for a concerted effort from both policymakers and the academia to come up with valuable policies and recommendations to mitigate the scenario.

Despite the extant literature, accounting for the effect of securities regulation is still lacking in the context of Africa and remains a serious gap in the empirical literature. When regulations relating to financial sector are well established and enforced, issues regarding information asymmetry[5], insider trading, inadequate and weak financial disclosure among

[4] A probability/ of occurrence of loss in a return of an investment
[5] An unequal/imperfect knowledge that one party to a transaction has superior information than the other.

others that deprive investors rights will be drastically reduced. In another investigation, Akyol, Cooper, Meoli, and Vismara (2014) posit that securities regulation increases the quality of financial reporting, transparency, and maintain investors' confidence. Similarly, Levine (1999) states that financial markets are strongly established in countries with efficient regulatory and legal system. It is also observed that self-regulation of markets contributes to higher productivity, competition, efficiency and growth (Sanusi, 2010). In a recent study, Teall (2018) reveals that the essence of market regulation and its enforcement is to provide what the market on its own cannot accomplish. Hence, a potential market failure and abuse can be mitigated in a well-regulated financial market to guard against criminals and unethical market participants. Therefore, macroeconomic stability and investor sentiment can be attained in a financially regulated market.

Needless to say, when financial regulations are ineffective, the investor's portfolio may seem to be less protected leading to confidence erosion, capital flight and panic selling of financial assets. Senbet and Otchere (2005) note that Sub-Saharan Africa has the highest percentage of private wealth held abroad than any other region ranging from 30-40 percent. In fact, a weak regulation is a compromise to market abuse and a setback to market development as Bekhet and Matar (2013) and Hussain et al, (2015), note that, in the absence of a strong regulatory framework, the economic policies may have a restricted effect on stabilizing an emerging economy. Nevertheless, many financial markets suffer due to inadequate securities regulation. In fact, Yildiz, Karan, and Pirgaip (2017) conclude that market abuse due to poor securities regulation remains a serious challenge in emerging financial markets threatening their development. Hence, this study attempts to fill the gap

in the literature by estimating the effect of regulation on stock market development in Africa. The knowledge can assist investors to optimize their portfolio diversification to the African stock market.

Additionally, the interaction between stock markets and banks in the African financial system has not received sufficient empirical evidence in the previous literature. Allen et al. (2011) assert that the financial system of Africa is dominated by traditional banking services and informal finance. Therefore, the continent's financial market is left far behind which is characterized by low financial literacy and less-efficient equity markets. The only exceptions are two country-based empirical studies on how the variables interact in Nigeria and Kenya respectively (Arize, Kalu, & Nkwor, 2018; Osoro & Osano, 2014). There is no panel study that predicts how banks and stock markets interact in the region. In other words, the unique predictive power of banking sector development on the stock market has not been empirically investigated in the African literature despite an assertion that investors economic outlook and confidence may have an effect on their asset allocation decision (Chen & Craig, 2018).

In the same vein, the African financial system is highly dominated by the banking sector as many investors rely primarily on banks to obtain finances for new business or developing the existing business despite the high interest rates charged by those deposit money banks with short-term maturity. In other words, the African countries are bank-based in view (Menyah, Nazlioglu, & Wolde-Rufael, 2014). Despite its dominance, the banking sector is still not liquid to meet up the investor liquidity challenges in the region.

However, with efficient stock markets, African investors can deviate from the short-term high-interest loans to long-term financing in capital markets. In fact, with more developed stock markets, the liquidity inflows in a financial system can be more broadened as both the foreign and domestic investors can patronize the market.

In addition, the unstable economic forces in the African region is said to have hindered a sustainable growth of nations. Addo (2013) disclose that maintaining stability of economic forces is necessary and challenging to the African continent. Similarly, Ho (2011) posits that understanding the role of economic forces is a bedrock for successful investment. Hence, investors and financial analysts utilize their ample time studying the trend and information relating to economic forces for future investment decision. Similarly, stock price changes are a reflection of changes in investors' expectation about the future value of factors that influence stock prices. Mishra and Singh (2011) observe that stock return is a function of future cash flow stream and is highly dependent on market conditions. Recently, the findings of Kurov and Stan (2018) suggest that economic forces play a vital role in shaping investors expectation about future policies.

In spite of the existing literature (Odhiambo, 2010; Fowowe & Abidoye, 2012), more need to be done to find how poverty reduction interacts with stock market in Africa. In fact, the level of poverty in African countries is on the increase as this is presumed to affect stock market development through a decrease in aggregate income and investment. To be more specific, due to abject poverty, most of the Africans struggle to meet their basic necessity of life and do not have means for investing in stock market which is a serious stumbling

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block to the stock market development. According to Ojeaga (2014), the African region has the highest population living below the poverty line. This is a serious issue affecting the domestic investment that should be adequately addressed. In the light of the aforementioned literature, this study investigates how poverty reduction contributes to stock market development.

Despite prevalence of empirical literature, not much is known to date about the effect of life expectancy on stock market development. The few available literatures are on the interaction between life expectancy and economic growth (Ecevit, 2013; Hami, 2016; Kinugasa et al. 2010). The African region was characterized by a poor health condition which adversely affects life expectancy and investment in the region. Therefore, with increase in health facilities of the continent, it is anticipated that individuals would work to save more with a higher probability of living long (Turan, 2009). The African region is characterized by chronic diseases and a high mortality rate coupled with inadequate medical and health-care interventions.

It is worth to mention that Oghagbon and Giménez-llort (2014) affirm an increasing level of non-communicable diseases in Africa while Sahn (2013) states that the vast majority of low GDP and truncated life expectancy is prevalent in the African countries. These are major threats to the inhabitants to work, save and invest in order to increase productivity and promote the welfare of households even after their retirement. Bloom and Canning (2008) assert that health is an instrument for raising income level thus a poor health condition tends to be connected to a short lifetime. Therefore, the probability of a short life

can be detrimental to future savings and investment. It is more comprehensive to consider how life expectancy affects stock market development in the African region.

Attempts have been made to investigate the effect of unemployment on stock market development. However, the studies are country-specific studies for South Africa (Tapa et al., 2016) and Nigeria (Ilo, 2015). A holistic approach needs to be taken to conduct a panel study on how unemployment predicts stock market development in Africa. The unemployment in African region is on the escalating trend which is becoming a socio-economic threat where a growing number of the unemployed citizens cannot be absorbed by the available job opportunities. Baah-boateng (2016) observes that without a sufficient job opportunity, the increasing number of educated unemployed youth could be detrimental and a source of conflict to Africa. Similarly, Ilo (2015) emphasizes that unemployment has been prohibitively high in Africa since the adoption of the structural adjustment program and has contributed to low economic growth.

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However, weak governance poses serious threats to the investment in Africa and is presumed to affect the stock market development. Evidently, Chau, Deesomsak, and Wang (2014) note that uncertainty affects investors' confidence and create avoidable fear in the financial market. In a related study, Naik and Padhi (2012) observe that investors react to a change in political climate by altering their portfolio composition while Asteriou and Siriopoulos (2000) posit that the risk of losing investment arises in an unstable political environment. Diamonte, Liew, & Stevens (1996) also view investors' ability to forecast changes in political risk affect their portfolio returns. According to Bailey and Chung

(1995), firms' cash flows that are sensitive to general economic condition may be prone to political risk thus a less violent society has a greater potential for financial market development.

In addition, the African region has been less considered in the extant literature on how export growth improves stock market development. To improve the trade-related economic development potential for Africa, taking an all-inclusive approach for harnessing the abundant natural resources of the continent becomes a vital issue for consideration. Sheridan (2014) pointed out that development is multidimensional that cut across several aspects including investment, education and trading. Therefore, market competition and innovation can help in promoting sustainable growth both at the country and firm level. In addition, Regolo (2017) contends that growth in the cross-country trade leads to significant market expansion of firms seeking diversification while Yee (2016) asserts that survival increase with firms' export experience.

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It is worthy of noting that Easterly and Reshef (2010) affirm a low share of manufacturing export from Sub-Saharan Africa as most of the countries are undiversified and depend on single commodity export. This is challenging and is adversely affecting the economies of the region as foreign exchange generated from export can be utilized to promote the infant industries and embark on social development projects. In their paper on 'what you export matters', Hausmann, Hwang and Rodrik (2007) suggest that apart from the physical and human capital endowment, specialization on manufacturing and production of certain products will have a greater potential for export growth of nations.

Available statistics from the United Nation Conference on Trade and Development (UNCTD, 2017) reveals that African countries performed below expectation due to their failure to promote growth through diversification. In fact, most of the countries depend on one or a few commodities for export. Moreover, the 2016 African Economic Outlook (AEO) report indicates that the decline of commodity prices had a shocking impact on many commodity-exporting African economies. This is in support of the assertion that countries isolated geographically from the world market may end up with a lower per capita (Sachs & Warner, 1997). Therefore, expanding the continent's export horizon with more processed and manufactured goods remain critical for firms' growth and long-term investment for development. This justifies the growing interest to investigate the predictive power of export growth on stock market development in Africa.

Needless to say, however, the exchange rate depreciation in Africa is a major source of worry for investors seeking diversification to Africa. In other words, depreciation of currency is a source of concern to global investors looking for a stable economic environment. This is in line with the conclusion of Mbulawa (2015) that volatility of economic fundamentals gives little incentive to firms and investors to participate in stock market. Furthermore, the high interest rates in most African countries tend to motivate savings instead of investment which may affect the functioning of the equity markets in the region. Papadomou et al. (2016) disclose that investors decision is mainly based on economic forces that are affected by monetary policy pronouncement. To be more specific, Dahou et al. (2009) assert that a rise in interest rate reflects a high cost of credit in Africa.

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Hence, stability of economic fundamentals become a necessary factor for consideration before making investment decision.

Though, efforts were made from previous researches to investigate the possible determinants of stock market development in Africa, the findings are far from been conclusive as some studies show a significant positive relationship (Ojo & Ayadi, 2014; Ndako, 2012; Asiedu & Freeman, 2009) others show a negative relationship (Abakah & Adusah-poku, 2016; Sum, 2013) while an insignificant nexus was also found by Aduda, Masila and Onsongo (2012).

Moreover, the extant literature concentrate on the general macroeconomic determinants of stock market development, including on how gross domestic product (Nyasha & Odhiambo, 2015), exchange rates (Umer, Sevil, & Kamişli, 2015), interest rates (Addo & Sunzuoye, 2013), inflation rates (Laichena & Obwogi, 2015), money supply (Babayemi, Asare, Onwuka, Singh, & James, 2013) and industrial production (Eita, 2012) predict stock market. Other studies were conducted on the individual countries (Solarin & Sahu 2015; Laichena & Obwogi, 2015; Aduda et al 2012; Khan & Zaman, 2012; Andrianaivo & Yartey, 2010).

In terms of methodology, most of the previous African studies (Babayemi et al., 2013; Cherif & Gazdar, 2010; Naceur, Ghazouani, & Omran, 2007) concentrate on traditional panel estimation techniques of pooled ordinary least squares (POLS), fixed effect (FE) and random effect (RE) models. Other African studies (Adjasi & Biekpe, 2009; Andrianaivo

& Yartey, 2010; Assefa & Mollick, 2014) employ the generalized method of moments (GMM) in their modeling.

However, the static (traditional) panel models have some noticeable shortcomings. For instance, the POLS model disregards individual heterogeneity and imposes slope coefficients for all the cross-sections. On the other hand, the parameter estimates of the FE model are biased when some regressors correlate with error term. One of the limitations of RE is that the model is time invariant as error term at any period is correlated with the past, future and present. These limitations can lead to a serious estimation bias (Campos & Kinoshita, 2008; Holly & Raissi, 2009; Loayza & Rancière, 2006). In summary, the static panel data models do not capture a dynamic nature of data which is a serious fundamental issue in the empirical literature.

On the contrary, the dynamic model of generalized method of moments (GMM) is used for estimating micro panel dataset (N>T) and is not suitable for studies having longer period compared to cross-section (Eberhardt, 2012). In fact, Roodman (2009) argued that estimation of GMM model using a small N and larger T dataset can lead to a spurious regression due to the violation of the model underlying assumptions. Another limitation of using GMM for macro data such as the present study is that GMM model ignores variables stationarity and it is restricted to short-run dynamics. Hence, employing GMM for estimation of macro data imposing homogeneity assumption on slope coefficients of lagged dependent variable can be inconsistent and misleading (Kiviet, 1995; Pesaran & Smith, 1995).

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Therefore, based on the limitation of the static models and GMM discussed, this study employed the Pesaran et al. (1999) pooled mean group (PMG) model to investigate the predictive power of regulatory quality, banking sector development and selected economic forces on stock market development. Based on the underlying theoretical assumptions of PMG, the model has several advantages over the static panel of POLS, FE and RE models. For example, the model estimates speed of adjustment to long run equilibrium (convergence coefficient) to be heterogenous while imposing homogeneity for long run estimates across the cross sections. In addition, the model can be estimated regardless of the order of series integration (stationarity). It can be suitable for variables of I(*1*), I(*0*) of mixed integration order provided it does not exceed I(*1*). The PMG is appropriate for estimating long panel data set of T > N and it is robust to misspecification.

Despite efforts of the researches in finding the causes of low stock market development in the region, the problem remains unsettled and the indicators of market development (market capitalization, the stock traded and turnover ratio) in Africa continue to decline especially after the 2008 global financial crises. In fact, a mere increase in the number of stock exchanges on the African continent does not have significant contribution to investors seeking diversification and looking for additional financing. The previous studies reveal one of the reasons for their inability to provide financing needs to investors is that the stock markets in the region remain concentrated, smaller in size and illiquid (Hearn & Piesse, 2010; Odhiambo, 2012). Therefore, it is important to conduct a study to investigate the impact of regulation, banking development and selected economic forces on the stock

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market development using the pooled mean group (PMG) model for the period spanning 1996 to 2016.

1.4 Research Questions

Based on the problem statement discussed, the following research questions are formulated:

i. What is the impact of regulation on stock market development?

ii. What is the impact of banking development on stock market development?

iii. What is the impact of life expectancy on stock market development?

iv. What is the impact of poverty reduction on stock market development?

v. What is the impact of unemployment on stock market development?

vi. What is the impact of export growth on stock market development?

vii. What are the impacts of the control variables (exchange rate, interest rate, financial crisis) on stock market development?

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1.5 Objectives of the Study

The main objective of this study is to investigate the effects of regulation, banking development and selected economic factors on stock market development with evidence from selected African countries while the specific objectives are to investigate:

i. The impact of life expectancy on stock market development in selected African countries;

ii. The impact of poverty reduction on stock market development in selected African countries;

iii. The impact of unemployment on stock market development in selected African countries;

iv. The impact of export growth on stock market development in selected African countries;

v. The impacts of control variables (exchange rates, interest rates, financial crisis) on stock market development in selected African countries.

1.6 Significance of the Study

This study makes both theoretical and empirical contribution to the existing stock of knowledge. On a general note, it opens a new dimension to the study of stock market development in the African countries as little attention was given to the impact of regulation, banking development and economic factors on the stock market development. For academia, this study would buttress both the theoretical and empirical literature on the impact of regulation, banking development and economic factors on stock market development.

The slow development of the African market confirms the assertion of some previous literature (Asongu, 2012; Assefa & Mollick, 2014; Hearn & Piesse, 2010) that African stock exchanges are smaller and illiquid compared to other emerging stock markets. The African stock markets are underdeveloped with less information efficiency. Hence, the general contribution is how regulatory quality, banking sector development and selected economic forces explain the changes in African stock market development. Unlike the study of Bello (2014) that suggest a significant effect of regulatory quality on stock market

development in Nigeria, the present study investigated this nexus using panel evidence in Africa.

The positive relationship between stock market development and the regulatory quality is an indication that when regulations relating to the financial sector are well established and enforced, issues regarding information asymmetry, insider trading, inadequate and weak financial disclosure that deprive investors rights will be drastically reduced. The empirical result demonstrates that the market reaction to financial regulation will restore the confidence of investors, attract investment opportunities and can accelerate market recovery from the aftermath of the 2008 global financial crisis. This is in line with the assertion that positive market reaction on regulation indicates the effectiveness of financial regulation on firms' operation (Yang & He, 2018).

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This possibility has not been explored, at least in the existing panel studies of Africa, which is an important contribution to the existing pool of knowledge. In fact, the confidence of investors in the financial market can be restored through a provision of adequate and strong regulation that can eliminate both insider information and market manipulation. Hence, the findings may serve as a rich source of information to enhance the existing securities regulation, attract investment opportunities and promote market development.

Similarly, due to the multidimensional nature of stock market development, the present study differs from the previous literature in this area as it constructed a composite index using principal component analysis (PCA) to represent the three main indicators (market

capitalization, turnover ratio and the stock traded value) of stock market development. The application of the PCA is to merge the most widely used proxies into a single index for the overall stock market development. Levine and Zervos (1998) and Levine (2005), contend that using stock market development indicators separately has a shortcoming and does not represent an entire development of the stock market.

Abdi and Williams (2010) argue that the goal of principal component analysis as a multivariate technique is to extract important information from different dimensions to be represented using a single index. The composite index, therefore, represents an important contribution of this study as the existing African Studies (Abdalla & Dafaalla, 2011; Aduda et al., 2012; John & Duke, 2013) used either market capitalization, the stock traded or turnover ratio separately to represent stock market development. In other words, capturing the main indicators using a composite index provides a richer picture of the stock market development.

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In addition, little attention is given in the literature regarding the empirical link between banking development and stock market development in Africa. Although Nyasha and Odhiambo (2015) found evidence of unidirectional causality from banks to the stock market in South Africa, the previous empirical literature is mostly from advanced and other emerging economies (Ayaydin & Baltaci, 2013; Cheng, 2012; Pradhan, Tripathy, & Pandey, 2014) and they reveal an inconsistency in their findings. There is little effort to examine empirically how banking development relates to the stock market in the African region, especially using panel evidence. In other words, the unique predictive power of

banking sector development on the stock market has not been investigated in the African literature despite an assertion that investors economic outlook and confidence may have an effect on their asset allocation decision (Chen & Craig, 2018).

Consequently, investigating the banking development-stock market nexus can boost the financial system of the African region and improve the low development of stock markets. The only exceptions are two country-based empirical studies on how banks and stock markets interact in Nigeria and Kenya respectively (Arize et al., 2018; Osoro & Osano, 2014). Therefore, this study contributed by showing a significant relationship between banking development and stock market using panel data evidence from Africa. A strong interaction between the stock market and banks will invariably promote private sector investment, financial inclusion and profitability of firms on the African continent.

For the poverty reduction-stock market nexus, previous studies disclose that the level of poverty in African countries is on the increase which inhibits household in accessing funds for their family need. It was revealed that Africa remains the poorest continent among the developing countries (Ouyang, Shimeles, & Thorbecke, 2019), and the prevailing poverty rate dampens subsequent growth in Africa (Thorbecke & Ouyang, 2018). However, the increasing poverty level raises a question of how households generate income and make further investment in financial markets. Thus, poverty reduction policies are highly needed in Africa to promote long-term investment in financial markets. In other words, poverty reduction should be on the agenda of the African policymakers as it has a potential of

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transforming the live of households to explore the untapped investment opportunities on the continent.

The prior literature has been silent about the possible effect of poverty reduction on stock market development despite Beck, Demirgüç-Kunt, and Levine (2007) suggest that poverty reduction may stimulate demand for financial services. Intuitively, when poverty level is reduced, the household can have access to finance while their unspent income can be invested in the stock market which provides more investment opportunities for firms and businesses. The extant literature is on how financial development predict poverty reduction (Fowowe & Abidoye, 2012; Odhiambo, 2010). Hence, this study bridges the literature gap by providing empirical evidence that poverty reduction has a positive effect on stock market development which represents new evidence in the African financial market literature.

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The level of poverty is presumed to affect stock market development through a decrease in aggregate income and investment in the region. The pro-stock market development policies on the African continent should be central to poverty reduction strategies based on the findings of this study. To the best of knowledge, the findings of this study remains a novel contribution to the effect of poverty reduction on stock market development in Africa.

Another important theoretical contribution of this study is the effect of life expectancy on stock market development. Despite the impact of life expectancy on economic growth

(Ogundari & Awokuse, 2018; Ojeaga, 2014), its implication on the stock market is rarely addressed in empirical literature thus understanding how stock market responds to changes in life expectancy is necessary and calls for a further empirical study. Notwithstanding the inadequate empirical studies on life expectancy-stock market development nexus, understanding how stock market responds to changes in life expectancy is necessary and this study has contributed to filling the gap by finding evidence of a significant positive relationship between life expectancy and stock market development. The rise of people lifetime/longevity has an incentive of promoting their wealth accumulation and investment in the financial market. Similarly, a rise in life expectancy can enhance the welfare of workers and can improve their productivity.

The inadequate African panel studies provide this study an additional impetus to empirically examine how unemployment predicts stock market development. Unlike the works of Ilo (2015) that examine the nexus between capital market and unemployment in Nigeria as well as the study of Tapa, Tom, Lekoma, Ebersohn, and Phiri (2016) on the relationship between unemployment and stock market in South Africa, the present study uses panel data for the selected African economies and found an existence of a significant relationship between the unemployment and stock market development. The results represent a significant contribution to the extant literature, particularly in the African region.

Furthermore, the present study contributes to the existing body of knowledge by examining how export growth and stock market development are related to Africa. Therefore, expanding the continent's export horizon with more processed and manufactured goods

remain critical for firms' growth and stock market development. The existing studies (Njikam, 2017; Sunde, 2017) focused on the export-led growth hypothesis in Africa. On the contrary, this study provides empirical evidence that export growth has a positive and significant effect on the stock market development. This is a novel contribution to the existing studies that concentrate on the export-led growth hypothesis. In fact, to improve the trade-related growth potential for African firms, taking an all-inclusive approach to harnessing the abundant natural resources of the continent becomes a vital issue for consideration.

Another important contribution of this study to the existing literature is accounting for the existence of a structural break in the estimation due to the 2008 global financial crisis (GFC) that cause damages to financial markets and economic sectors globally. The findings uncover the structural break due to the financial crisis has a negative impact on the African stock market development. Despite the adverse effect of the crisis, little attention has been paid to the recovery phase. However, Njiforti (2015) is one of the key studies supporting the findings of this study. Taking adequate and proactive measures including strengthening regulatory reforms will go a long way in mitigating the adverse effect of a future crisis on the African financial markets. This represents a key contribution as the African stock markets are encountering slow recovery from the aftermath of the 2008 GFC. In fact, appropriate policy reforms have the potential of improving the rate of shock absorption in a future crisis.

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Moreover, based on the existing literature, the present study is among the early African studies (Coulibaly, 2015; Shahbaz, Solarin, Sbia, & Bibi, 2015) that employ the pooled mean group (PMG), model. Unlike the traditional panel models that estimate a short-run causal relationship, the PMG is a dynamic panel model that estimates a long-run equilibrium relationship between a dependent variable and it regressors. The model has several advantages over the static panel of POLS, FE and RE models as the static models do not account for the effect of external shocks. A long-run equilibrium is expected among variables due to budget constraints, arbitrage condition and technology affecting groups in a similar way (Pesaran, 2015).

Similarly, is was stated that dynamic panel models control for unobserved panel effect that is lacking in static models (Ahmed, 2018). Among its advantages, the PMG model enhances the forecasting process to address the poor development of African stock markets. It also estimates the speed of adjustment to long-run equilibrium (convergence coefficient) while imposing homogeneity for long-run estimates across the cross-sections. In addition, the model can be estimated regardless of the order of series integration/variables stationarity.

Finally, the present study provides significant contributions to economic policy affecting stock market development. The findings would guide policymakers in formulating sound and effective policy reforms to accelerate the development of African stock market in particular and the entire financial system of the continent at large. To be more specific, implementing policy recommendations of the present study will restore the declining

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confidence of investors on the African financial market and can be an opportunity for the continent market integration with the global stock market. In addition, using the recommendations will play a vital policy-influencing role in mitigating the adverse effect of future financial crisis, guide market practitioners and attract more investment opportunities on the continent. Thus, attention should be given towards formulating more market-oriented policies to expedite the recovery process.

1.7 Scope of the Study

This study specifically focused on the effects of regulatory quality, banking development, poverty reduction, life expectancy, unemployment and export growth on the stock market development in selected African countries. Similarly, exchange rates and interest rates are used as control variables of the study because other studies used them as explanatory variables. In addition, this study considers the structural break due to the last global financial crisis (GFC) to see how it empirically predicts the African stock market development.

To achieve the objective of the study, 12 African countries which are Cote d'Ivoire, Egypt, Ghana, Kenya, Malawi, Mauritius, Morocco, Namibia, Nigeria, South Africa, Uganda, and Zambia are selected for the period 1996 to 2016. The selection of the countries was based on data availability and a persistent fall in the indicators of the stock market development. Hence, the research questions of the present study were answered using the Pesaran et al. (1999) Pooled Mean Group (PMG) model.

1.8 Organization of the Study

The study is organized into five main chapters where the first chapter discusses the background of the study, problem statement, presents research questions, objectives of the study, significance, scope and the organization of the study. The second chapter presents a review of the related literature. Chapter three deals with research methodology while the focus of chapter four is on the presentation and discussion of results. The last chapter of the study/chapter five discusses the summary of findings, recommendation and policy implication of the results.

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CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter discusses the literature review related to the study. The chapter starts with the concept of stock market development as well as the empirical literature related to the variables of this research and concludes with the gaps identified in the literature review. It also made theoretical review where it discusses the possible theories employed in the study

2.2 The Concept of Stock Market Development

A stock market is where shares or stocks of public listed firms are traded. Levine and Zervos (1996) state that theories do not offer a unique concept or the measure of stock market development due to its multidimensional nature. El-wassal (2013) defines stock market development as ability of markets to satisfy economic needs through a provision of better and quality services. However, it is a multi-faceted concept because there is no single measure that captures all the features of stock market development. The literature suggests different measures that capture different aspects of the market development especially market capitalization, the stock traded value and turnover ratio.

The first indicator is the market capitalization ratio which measures the value of shares listed on a stock exchange divide by gross domestic product (GDP). Therefore, the higher the ratio, the larger and more developed is the market. Another measure of the stock market is turnover ratio which connotes the value of shares divides by the market capitalization. It indicates the frequency at which the outstanding volume of shares change hands (Levine,

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2005). In addition, Yartey (2007) notes that a greater amount of savings are channeled through a more liquid market which is the sum of the value of shares traded.

The third is a volume-based indicator of market development known as the stock traded value. As the name suggests, it indicates the value of equities traded in the market divided by GDP. In other words, it measures the price of equity transactions comparative to the size of the economy. Since there is no theoretical justification for supremacy among these indicators, this study constructed a composite index that captures all the three indicators to examine how the market reacts to regulation, banking development and economic forces in Africa.

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2.3 Background of African Stock Exchanges

This section gives a background of the twelve (12) African stock exchanges that form the sample of this study as follows:

2.3.1 Bourse Regionale des Valeurs Mobilieres (BRVM)

The BRVM is a West African regional stock exchange that commences trading in 1987 and is based in Abidjan. The West African Monetary Union (WAMU) treaty of 1973 give rise to the establishment of the regional stock exchange after setting up a legal constitution. However, the BVRM is globally the first regional stock exchange and is a member of the African Stock Exchange Association (ASEA) and the World Federation of Exchanges (WFE) operating on an electronic trading platform. The exchange introduces a lot of projects and programs that transform and improve its liquidity as well as foreign and local

investment. This regional stock market is expected to facilitate saving mobilization for investment in productive economic sectors to boost the region's economic growth. Recently, the performance of the stock exchange decline due to a declining price while the market capitalization stood at $12 billion as at the end of 2017 (ASEA, 2016; ASEA, 2017).

2.3.2 Egyptian Stock Exchange (EGX)

The Egyptian stock exchange (EGX) was established in 1883 and located in Alexandria. The stock exchange was very active but had experienced a reduction in trading from 1961-1992 when socialist policies were adopted in the 1950s. The stock exchange was transformed to meet the international and global standard and is regulated and supervised by the Egyptian Financial and Supervisory Authority (EFSA). The market is trading on equities, bonds and funds, it continues to develop and expand its services. The exchange launched its first trading session in the Nile Stock Exchange (NILEX) in 2010 where it started to cater for trading in small and medium companies of the Middle East and North Africa (MENA) region. In fact, it acts as a gateway for financing firms willing to expand their capital base or business horizon.

Similarly, the EGX is liberalized in such a way that no restrictions were imposed on foreign investments and profit repatriation. Similarly, there was no tax payment for a dividend, capital gain and interest payment on bonds floated by individuals and corporate entities. The EGX is also a member of the World Federation of Exchanges (WFE), African Securities Exchange Association (ASEA), Federation of Euro-Asian Stock Exchange and Union of Arab Exchanges among others. The market capitalization to GDP ratio of the EGX was 30% in 2017 (ASEA 2017; ASEA 2016).

2.3.3 Ghana Stock Exchange (GSE)

The establishment of the Ghana Stock Exchange took place in 1989 and it was inaugurated in 1990 set up as a legal entity, limited by guarantee. However, among its innovations, the exchange market has introduced GSE Composite Index and the GSE Financial Stock Index to replace the former GSE All-Share Index. It has recorded an unprecedented advancement and market capitalization has increased by 136.59% as a result of listing the Tullow Oil public liability company (PLC) and some additional listings in December 2010. However, there has been an online trading platform, and trading took place in the equities and bonds while the ratio of market capitalization to GDP was 28.56 in 2017 (ASEA 2016; ASEA 2017).

2.3.4 Nairobi Securities Exchange (NSE)

The Nairobi Securities Exchange (NSE) was established in 1954 as a voluntary association of stockbrokers. It is the oldest and largest securities exchange in the Eastern Africa that evolves in the development of an efficient market. It is regulated and supervised by the Capital Market Authority (CMA) and was registered under the Companies Act in 1991. However, there were some capital market reforms to improve its performance where the Capital Market Authority was amended to Capital Market Act. To speed up transaction and enhance market efficiency, an electronic trading system was introduced to replace the open-outcry method. The NSE has been facilitating the mobilization of savings from the dormant to active agents and recently, it launched an exchange-traded fund (ETF) as a strategy to enhance the market access and financial inclusion.

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Despite the recent reform in Kenya to promote market patronage, the NSE is still encountering some challenges that include inadequate sensitization on the activities of stock exchanges, vulnerability to shocks, low investor confidence and lack of a competitive pressure among others (ASEA 2017; ASEA 2016; Nyasha & Odhiambo, 2014).

2.3.5 Malawi Stock Exchange (MSE)

The MSE was established in 1994 and is regulated by the Reserve Bank of Malawi (RBM) operating under the capital market development act of 1990 and the company's act of 1985. The first listing was made for National Insurance Company Limited. However, before MSE started listing, its main activities were facilitating secondary markets like trading of Malawi capital market securities including treasury bills and local registered stocks. Despite the challenges bedeviling the Malawi financial system, MSE is restructuring its operation by the listing of both corporate and government bonds and launching of central share depository system. Moreover, the MSE records a very small primary market activity with no additional new listing. In fact, due to the voluntary delisting of Malawi packaging industries, the number of listed companies drops to 14 as of 2016.

Furthermore, the exchange recently commences electronic trading after implementing its automated trading system (ATS) with a determination of allowing investors to enjoy more trading hours, a quicker transaction processing and shorter settlement period. However, the market capitalization ratio to GDP for the exchange in 2017 was 20.46% (ASEA 2017; ASEA 2016).

2.3.6 Stock Exchange of Mauritius (SEM)

The Stock Exchange of Mauritius was established in 1989 with an objective of promoting and developing efficient capital market operation. In 2001, the SEM was upgraded from the traditional trading platform to an electronic system. However, the exchange became a member of the World Federation of Exchange in 2005 with foreign participation of up to 25-35% in the market. As one of the African leading stock exchanges, SEM initiates programs that modernize its operation and attract more investors. One of the initiatives is the creation of a derivative segment for trading in futures and listing of global specialized funds.

The SEM is in two segments as there is an official market and the development and enterprise market (DEM) launched in 2006 to cater for the small and medium-sized transactions as well as for the newly established firms. Also, it was awarded the most innovative African Stock Exchange for 2011 at the African investment (Ai) annual index series award. The award was as a result of exceptional progress recorded by the stock exchange. Similarly, it has strong support for investor education through a range of information, financial education and financial literacy which have increased investors' desire to take part in the financial market. As of 2017, the market capitalization to GDP ratio of the exchange rise to 89%. With the emergence of the exchange, the conventional investment mindset keeps changing to more of stock market activities. Similarly, the SEM started digitizing it services which allow investors to have access to online trading and other important activities (ASEA 2017; ASEA 2016; Gowriah, Seetanah, John, & Keshav, 2014).

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2.3.7 Casablanca Stock Exchange (CSE)

The Casablanca Stock Exchange of Morocco was the third oldest stock exchange in Africa, established in 1929. The CSE was formally called Securities Trading Board. However, the transformation of CSE took place in 1993 when it became a private entity owned by the stockbrokers. It started electronic trading system in 2001 and later upgraded with more efficiency and speed in 2008. However, the CSE joined the World Federation of Exchanges in 2010. As at 2011, it became a member of the French-speaking exchanges association with a market capitalization to GDP ratio of 28.56 in 2017 (ASEA 2017; ASEA 2016).

2.3.8 Namibia Stock Exchange (NSX)

The Namibia Stock Exchange was set up in 1985 as a self-regulating organization under the stock exchange control Act of 1985. The NSX is licensed by the Namibian Financial Institution and Supervisory Authority (NAMFISA), based in Windhoek and started operation in 1992. Due to the moderate size of the Namibian economy, most of the listed companies are the South African holding companies of Namibia branches or subsidiaries. As at 31 December 2017, there are 44 companies listed on the stock exchange. This increase is re-stating the position of the market as one of the largest exchanges by market capitalization. In fact, a significant portion of the growth of the market was attributed to the participation of foreign investors precisely South Africans. Moreover, the market provides an alternative hub to the country's banking sector with the aim of promoting growth and developing the financial system (ASEA 2017; ASEA 2016).

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2.3.9 Nigeria Stock Exchange (NiSX)

The Nigeria Stock Exchange (NiSX), formally Lagos Stock Exchange (LaSE) was established in 1960 and started operation in 1961. The Securities and Exchange Commission (SEC) regulates the stock exchange with active trading to restore investors' confidence. However, in 1985, the NSE introduced a Second Tier Securities Market to facilitate the raising of capital for the small and medium companies. Similarly, in 1991, NSE had migrated from an open outcry to an automated trading system called NASDAQ OMX. The NiSX is one of the three largest stock exchange in Africa that is still in slow recovery due to the persistent decline of its prices, performance and foreign portfolio outflows. Furthermore, NiSX is an executive committee member of the African Stock Exchanges Association (ASEA) and a member of the World Federation of Exchanges (WFE).

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The exchange launched its NiSX Lotus Islamic Index (NiSX LII) to accommodate the listing of Sharia-compliant equities in 2012. The equity market got full membership of WFE in 2014 which plays a vital role in increasing its credibility and providing an avenue for a sustained investment flow and international cooperation. As a mono-cultural economy with high dependence on income from oil export, the rise in oil price before the 2008 GFC provides a good hedging opportunity for foreign investment. However, the global reduction in oil demand with its attendant decrease in price contributes to the declining investors' confidence, foreign investment outflow and fall in stock price. However, the Nigerian economy started recovering from a recession in the second quarter of 2017 and the market capitalization ratio to GDP stood at 19.9% (ASEA 2017; ASEA 2016; Oloko, 2018).

2.3.10 Johannesburg Stock Exchange (JSE)

The Johannesburg Stock Exchange was established in 1887 and is based in the capital city of Johannesburg. The JSE is regulated by the Financial Service Board (FSB) as the second oldest and the most sophisticated stock exchange on the African continent trading in equities, bonds, and derivatives securities. The JSE became a member of the World Federation of Exchanges since 1963 though it was deregulated in 1995 to introduce private companies and allow for foreign participation. To ensure sanity in the market, a new insider trading act was introduced for efficiency in securities trading. The securities listed in JSE migrated to an electronic settlement platform in 2002 for seamless protection of the investor's financial securities through modernization of operations. The exchange was ranked number one stock exchange globally in 2010 and 2011 by the World economic forum competitiveness report. However, the exchange decries that 2017 was her challenging year and its clients with a decline in equity value traded by 11% (ASEA 2017; ASEA 2016).

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2.3.11 Uganda Securities Exchange (USE)

The Uganda Stock Exchange started operation as a company limited by guarantee. It is a self-regulating organization licensed by the Uganda Capital Market Authority to facilitate transactions in financial securities. However, in 2010, the U.S.E commence implementation of securities central depository as a part of its ongoing innovation. In an effort to fulfill its mandate, the exchange initiated the bonds, equities and related instrument forum (BERI) that meets quarterly to examine issues affecting the Uganda financial sector.

Moreover, the exchange market was formed as a non-profit making entity under a policy that transforms the Ugandan economy to a private sector driven.

In spite of the oversubscription of the initial public offering for local listing, there has not been any floatation involving local listing. The absence may be as a result of the inability of business owners and entrepreneurs to take advantage of the stock exchange market of Uganda as a vehicle for capital accumulation. In spite of a policy reform with a potential of diverting from the current traditional stocks/bonds transactions to derivatives, the equity turnover and volume recorded a sharp decline with a market capitalization ratio of 0.29 in 2017 (ASEA 2017; ASEA, 2016; Maghanga & Quisenberry, 2015).

2.3.12 Lusaka Stock Exchange (LuSE)

The LuSE of Zambia was established in 1994 and incorporated as a non-profit making organization. The exchange was owned by the stockbroking members that is responsible for developing the Zambian capital market and attracting foreign portfolio investment into the country. However, it is associating with the Central Bank of Zambia and other stakeholders to deepen the secondary bond market. Furthermore, the LuSE has been operating an integrated market for both bond and the equity securities for more than 20 years. The market facilitates the raising of relatively cheaper long-term capital and complements a financial product offering of short-term capital that was mainly floated by the money market operators. Furthermore, the exchange is currently operating an electronic clearing system that facilitates settlement of transaction within three days. It also launched a new state of the art trading and settlement system while the exchange's market capitalization ratio in 2017 was 12.71% (ASEA 2017; ASEA 2016).

2.4 Theories and Models of Stock Market Development

The theoretical nexus between stock market development and its explanatory variables are developed. This study reviewed five theories (Arbitrage Pricing Theory, Macroeconomic Factor Model, Life Cycle Hypothesis and Financial Development Models) that provide a link between the stock market and the explanatory variables of this study. Below are discussion of the theories and models on how the stock market development is linked to the variables of interest of this study.

2.4.1 Arbitrage Pricing Theory (APT)

The APT model was developed by Ross (1976) for explaining security values where the return on investment is a function of investment sensitivity to various common factors. In other words, the model indicates that multiple risk factors can be used to explain stock returns. A stock market is considered as a mirror of economic status where its growth denotes investors are confident about the future prospects of an economy. Nevertheless, Shrestha and Subedi (2014) disclose that a rapid growth of stock market needs satisfactory justification by the economic fundamentals, because a temporary up and down may compromise the prevailing economic and financial stability of a nation. The APT is developed to determine the factors influencing expected returns of securities in the financial markets.

Despite asset prices are reacting sensitively to economic news, the individual assets are affected by a variety of unpredictable events where some have a more common outcome on assets than others. The APT is however viewed as a substitute for capital asset pricing

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model (CAPM). Groenewold and Fraser (1997), stated that the APT is a superior alternative to the broadly used capital asset pricing model. Though the CAPM is a single factor model that uses market expected returns in its formula, the APT uses risky assets expected return and risk premium (Rasiah & Kim, 2011). The CAPM was described among the first attempts in the asset pricing theories that uses only the market return (single factor model) to predict the movement of a stock prices.

Paavola (2006) contends that the APT model has strength over the CAPM as it permits researchers to select factors that can best explain a particular sample. Similarly, Jecheche (2012) posits that the APT was introduced with a great potential to overcome the CAPM weaknesses as it requires less realistic assumptions and its explanatory power is better as a multifactor model. In fact, the Groenewold and Fraser (1997) study described the APT as the multi-index model which permits researchers to identify factors that can give the best explanation for their sample data. It is also considered as an essential branch of asset pricing theory (Connor & Korajczyk, 1995). Therefore, the uniqueness of variables predicting a movement of the stock market depends on the underlying assumptions.

Moreover, the arbitrage pricing is an unrestricted asset pricing model that holds in both single and multiple periods built on a linear return generation process. The model has an assumption that stock returns are determined according to factor models. Roll and Ross (1980) assert that the APT gives a concrete theoretical framework for determining whether the factor loadings are related to risk premia. Hence, the theory separates between systematic and unsystematic risk factors and allows alteration/inclusion of variables until

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the unsystematic portion of the risk disappears. To put it differently, a portfolio that is fully diversified has no unsystematic risk but still has a systematic risk.

The relationship between risk and return can be estimated using the following equation:

$$E_i = \alpha + \beta\rho \ldots\ldots\ldots\

Thus, the risk-return tradeoff of an investment that has both expected and unexpected portion can be determined using the following equation:

$$R = \bar{R} + U \ldots\ldots\ldots\

The seminal reference for the Macroeconomic Factor Model was the work of Chen et al., (1986) which employs some observable economic factors to price the United States equity returns. The model was developed with 5 variables that explain equity returns using the U.S data. Specifically, it investigates the effect of industrial production, change in risk premia, inflation and oil price on the equity returns of the United States economy. The authors found that the equity return is a function of economic factors and non-equity asset returns. Accordingly, the model is relatively specific on the factors that are found reliable in explaining the changes in equity returns. The conclusion of this model that asset prices should depend on their vulnerability on exogenous state variables is in line with the Merton (1973) intertemporal capital asset pricing model.

It is further stated that the modern financial theory gives more emphasis on the effect of pervasive/systematic state variables on pricing equity returns. However, Asgharian and Hansson (2001) postulate that other variables that are essential for economies can be added to the first developed macroeconomic factor models, especially where the equity markets are fairly integrated to the world economy. In fact, it links a stock market returns to expected cash flows and their dividend where any systematic factor that influences dividend can also affect equity returns. Humpe and Macmillan (2009) and Venkatraja (2014) posit that the Macroeconomic Factor Model is efficient in evaluating the long-run effect of macroeconomic factors on securities returns. Similarly, Flannery and Protopapadakis (2002) state that economic variables causing non-diversifiable risk for investors may be priced in the asset market equilibrium.

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The model further emphasizes that an arrival of new information relating to economic forces can have an influence on stock returns through their impact on the present value of the expected future dividend. It is evident that dividend is affected by variables that impact on a firm's profitability (Groenewold & Fraser, 1997). The anticipated/unanticipated arrival of information to markets can cause a movement of stock price due to the reaction of a dividend. Needless to say, the underlying effect of exogenous factors in explaining asset returns depends on theoretical assumptions. As such, the pricing effect of exogenous macroeconomic variables needs adequate empirical concern and this study is set to make further exploration in line with the underlying assumptions of asset pricing theories. The motivation behind conducting a further empirical study stem from the conclusion of the seminal work of Chen et al (1986) that their study has not thoroughly characterized the set of leading state variables on pricing asset returns.

Since stock price is described as a function of an expected future dividend and its discount rate, the theoretical intuition of a dividend discount model is expressed as follows:

$$P = \frac{D}{K - g} \ldots\ldots\ldots\

Where $\overline{R}$ is the expected equity return, D/P is the sum of dividend yield while g is a symbol of annual dividend growth rate.

2.4.3 The Life Cycle Hypothesis

The households' level of savings and consumption over their lifetime is an area of research that needs further empirical investigation. The Keynes (1936) Theory of Employment, Interest and Money describes savings as a category of good that could be purchased by households and its expenditure is motivated by income. On the contrary, the life cycle hypothesis of Modigliani and Brumberg, (1954) implies that savings rate is a function of income growth while the level of household savings/investment differs based on their demographic structure. In other words, the theory of life circle investment conjectures that the equilibrium returns of financial assets vary in reaction to a population structure of investors. Hence, a personal financial planning plays a vital role in households' expenditure and their standard of living over time. It is observed that financial assets remain the important vehicles for conveying resources across different time and outcome over a life cycle of investors (Bodie, Treussard, & Willen, 2007). Therefore, the investor's portfolio allocation[6] in line with the life cycle model is gaining ground in the empirical literature and the Goyal (2004) study suggests a positive nexus between age and investment.

However, it is not all investors that accumulate savings based on their working life to make investment in financial markets. Gomes and Michaelides (2005) state that most of the risk-averse investors do not invest in the equities market. Similarly, Hanna, Fan, and Chang

[6] A diversification investment strategy to minimize risk and maximize asset expected future returns.

(1995) were of the view that the life cycle model only gives a prescriptive response to the question of how much should be saved by consumers.

Mathematically, the relationship between a current consumption and its determining factors can be expressed below:

$$C = f(y, \overline{y}, a, t) = \frac{1}{Lt} y + \frac{(N-t)}{Lt} \overline{y} + \frac{1}{Lt} a \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.7)$$

Where y is the current income, $\overline{y}$ is the expected average income, the 'a' symbol represents initial asset while t is the age of households.

Therefore, a household savings is modeled using the following equation:

$$S = y - c = \frac{L-t}{t} y - \frac{N-t}{Lt} \overline{y} - \frac{1}{Lt} a \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.8)$$

In this case, L is the total lifetime, N is the earning span while S stands for savings.

Taking $\overline{y}$ as a general function of y, the marginal propensity to consume (MPC) at age t is written as:

$$\frac{dc}{dy} = \frac{1}{Lt} + \frac{N-t}{Lt} \frac{d\overline{y}}{dy} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.9)$$

This implies that the MPC depends on the average age of households and their expected income. The equation expressed the argument of the Modigliani (1986) study that consumers have a hump-shaped saving pattern as they want to smooth consumption time to maximize their lifetime utility.

Therefore, the households' asset holding based on their age structure is represented in the following equation:

$$A_t = \alpha_a + \beta_t + \delta_{t-a} \ldots\ldots\ldots\

However, the complementary function of the two segments of financial system development (banks and markets) is more effective in developed economies. For example, Boyd and Smith (1998) state that economies attain a high level of development when their debt and equity markets become complementary. Similarly, Demirguc-kunt and Maksimovic (1996) opine that the illiquidity of financial markets in a less-competitive environment cause investors to pay additional premium to acquire firms' equities.

The emphasis of the complementarity model of financial system development is the optimal use of debt and equity financing to implement a project. Therefore, this process is effectively executed when firms consider the implication of their financing mix. The Boyd and Smith model of Debt-Equity in a process of project implementation is expressed as follows:

$$X_t(y) = P_{t+1}\{(1 - Q^*{}_t)z(Q^*{}_t; \gamma_{t+1}) + Q^*{}_t y) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.11)$$

Here, $P_{t+1}((1 - Q^*{}_t)z(Q^*{}_t; \gamma_{t+1})$ represents the component of payment owed by firms from financial institutions, $(P_{t+1}Q^*{}_t y)$ is the equity holders payment component of the project while symbol z is the cost of monitoring. Therefore, there is a need for an optimal combination to attain firm's objective in project implementation. This process also affects the general economic development apart from the micro-financing expressed in project implementation. The complementarity emanates as firms cost of debt financing increase which makes it difficult for them to keep issuing debt alone without a corresponding support from the equity markets (Blackburn, Bose, & Capasso, 2005).

On the contrary, the substitutability model of financial development was developed with an expectation that banks and stock market are two alternative vehicles in the process of

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economic development. The economic growth is linked to a financial system through banks and equities market as major players in the growth process. However, the superiority of banks over the financial market is in line with the substitutability model of financial system development. The model was developed by Stiglitz (1985) where banks are given priority on financing investment than financial markets. The model reveals that a market-based financial system accommodates free-rider problem which can be circumvented by banks. In other words, a quick dissemination of information discourages investors from further spending to evaluate firms. In line with the Stiglitz's model prediction, Garcia and Liu (1999) posit that a monetary policy intervention on bank credit may lead to a negative link between banks and equity markets.

2.5 Previous Empirical Work

This section focused on the review of previous literature related to the explanatory variables of this study. These are regulatory quality, banking development, poverty reduction, life expectancy, unemployment and export growth while the exchange rate, interest rates and structural break are control variables of the study. Furthermore, the longtime existence of the stock market literature signifies its historical importance for the growth and development of nations. Several empirical studies were conducted on the link between the stock market and other economic variables using both time series and panel evidence. The general variables that were found to have contributed to variation of stock markets include but not restricted to the gross domestic product, exchange rates and interest rates.

The empirical literature on the relationship between stock market and the aforementioned variables were conducted with evidence of significant relationship (Beck & Levine, 2004;

Chipaumire & Ngirande, 2014; Eita, 2014; Huang, Liu, & Li, 2008; Khursheed, Ashraf, & Mohi-ud-din, 2014; Senturk & Ducan, 2014). Therefore, this study will control for their effect on the stock market development.

2.5.1 Regulatory Quality and Stock Market Development

Regulatory quality is an important variable that may contribute to the growth and development of financial markets. When regulations[7] relating to a financial sector development are well established and enforced, issues regarding information asymmetry, insider trading, inadequate and weak financial disclosure among others that usually deprive investors rights may be drastically reduced. Evidently, Akyol et al. (2014) posit that securities regulation increases the quality of financial reporting, transparency, and maintain investors' confidence. Similarly, Levine (1999) states that the financial markets are strongly established in countries with an efficient regulatory and legal system. Theoretically, Stigler (1964) conjectures that the motive behind securities market regulation is to increase the portion of truth in the world and to avert or discipline fraud. Therefore, a stock market is an attractive area for the theory of decisions under uncertainty hence securities regulation is a suitable clean area on how public policy is formulated.

However, due to a strong relationship between financial market and its regulatory agencies, Shi, Pukthuanthong, and Walker (2013) observe that the recent global financial crisis in 2008 has re-ignited discussion on the necessity for wide-ranging regulations in capital markets. The interaction between the stock markets and regulatory quality has been studied

[7] These are governmental regulatory agencies aimed at promoting securities transactions and safeguarding market against irregularities and any form of market abuse.

in developed economies with mixed findings. For example, it was found empirically that the securities regulation increase the stock market returns (Bailey, Chung, & Kang, 1999; Eng, Ha, & Nabar, 2013), is positively related to market growth (Demirgüç-kunt & Maksimovic, 1998; Ng, Dewandaru, & Ibrahim, 2015), leads to increase in trading volume (Bailey, Li, Mao, & Zhong, 2003) and it raises market turnover (Bagnoli, Watts, & Zhang, 2008).

Thus, the aforementioned empirical evidence confirms how the securities regulation promotes activities of the stock market in different aspects. In fact, it has gone a long way in boosting economic activities due to emergence of more investment opportunities. Secondly, it sanitizes the financial market environment because the informational advantage that was accessible to few individuals (asymmetric information) to the detriment of minority shareholders will be reduced when strong securities laws are enacted and enforced. The confidence of investors on the financial market can be restored through a provision of adequate and strong regulation that can eliminate both insider information and market manipulation.

Additionally, as stated, the information disclosure regulation in the securities market is an important driving factor for investors' confidence because the absence of such laws can instill fear in minds of general public. For that reason, La Porta, Lopez-de-silanes, and Shleifer (2006) note that a disclosure regulation improves the stock market activities because investors believe that there will be a strong legal and contractual penalties for misreporting. The authors further state that financial markets do not succeed when they are

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left to the market forces alone. Similarly, Hail and Leuz (2006) reveal that the financial markets development is linked to the extended information disclosure hence the inability of firms to unveil private information about their operation can send a warning signal to both existing and potential investors.

One of the significances of financial disclosure is to ensure fairness in how firms and investors conduct their operation devoid of unethical practices. Leuz and Verrecchia (2000) investigate the economic consequences of increased disclosure and the finding suggests that firms with additional disclosure exhibit lower bid-ask-spread and higher share turnover. They conclude that firms derive additional economic benefit after additional disclosure. A similar finding is reported by Qu et al. (2017) for high technology firms with an emphasis on the importance of using the company website to disseminate information to market and investors. After controlling for market size and legal protection of investors, Frost et al. (2006) found that stock market disclosure is positively associated with market development. The finding is in line with the agency theory postulation that a higher level of disclosure mitigates information asymmetry and increase the overall development of the market. Thus, a timely and credible disclosure of firms' information exerts an incremental contribution to market development due to fairness and transparency.

Conversely, Chauhan and Kumar (2018) investigate how investors value non-financial disclosure and their findings suggest that non-financial disclosure is more valuable to standalone firms than to business group firms. In fact, the positive valuation effect is associated with non-financial disclosure. A further review by Lan, Wang and Zhang (2013)

disclose that a voluntary disclosure has a positive relationship with firm size, leverage and the return on equity though the authors conclude that an extensive disclosure does not have a significant effect on the cost of capital. In contrast to the above findings, Bailey et al. (2003) suggest that a fair disclosure regulation inhibits firm's ability to forecast on its future annual earnings while Diamond and Kuan (2018) found that a regulatory change disadvantages investor in making a future investment.

Further exploring the importance of regulation on financial market reveal a negative relationship (Cai, 2010; Chou, Lee & Chen, 2005; Jain, Jain, & Rezaee, 2010; Ramiah, Pichelli, & Moosa, 2015) while other studies suggest a negative nexus between a weak securities regulation and equity returns (Giannetti,& Koskinen, 2010; Stulz, 2005). This portrays that a little effort is made on part of the policymakers at ensuring compliance and enforcement of new market regulations. Therefore, if the government and other relevant agencies play their role effectively, it will facilitate an efficient market operation through the mitigation of market abuse. La Porta et al. (1999) notes that strong laws can reduce ownership concentration in the market.

Nevertheless, there are studies that reveal information about a market regulation has no strong effect on stock prices and returns (Hsieh & Miller, 1990; Phylaktis, Kavussanos, & Manalis, 1999; Prevoo & Weel, 2010; Teets, 1992) attributing the insignificance to the fact that information is already reflected on prices especially in efficient financial markets. These studies report that most of the advanced stock markets are efficient as no investor can beat the markets through earning of abnormal returns. However, the Klapper and Love

(2002) study reveal mixed findings whereby the countries having strong regulations exert a significant effect than the weak regulation nations. One of the motives behind regulation is to ban firms from releasing information to analysts and investment professionals before unveiling the same to the general public. Usually, major investors target equity of firms that exert weak investor protection laws in order to have a controlling shareholding of those firms. Although, a strong protection leads to a higher return, the portfolio investors turn from investing in firms with poor protection as it dampens their motivation to partake in the markets.

Needless to say, most of the developed financial markets apply various regulatory tools and strategies to promote market efficiency and control for unethical practices. The empirical studies reviewed found the implication of adopting or executing a regulation or how investors and the entire market react to regulations. For example, a trading halt is a regulatory tool for interrupting trading in order to allow investors to evaluate the arrival of new information. Therefore, securities trading is suspended by market operators to restrict unfair trading or prevent some investors from taking advantages as a result of having access to private information affecting the market. The suspension of trading is necessary because information is a vital resource in the creation of market expectation on securities prices. Doque and Fazenda (2003) disclose that a trading halt prevents informed traders from earning abnormal returns through price discovery. To be more specific, a trading halt can be interpreted as a timely intervention by market authorities to circumvent a market overreaction through price volatility. In his theory, Keynes (1936) postulates that asset price fluctuation can cause an excessive and absurd effect on financial markets.

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Moreover, a strong regulation can promote macroeconomic stability and can control for the adverse effect of financial market collapse on the real economy. The market regulators use a trading halt to allow investors to evaluate the latest and relevant information released by their firms. Some studies found that trading halt increases both the volume and price volatility (Frino, Lecce, & Segara, 2011; Lee, Ready, & Seguin, 1994) and they concluded that trading halt is associated with highly informative news events affecting price and the entire market. Conversely, Ahmadi, Janani, and Aqha-Mohammadi (2013) found the existence of a significant correlation between a trading halt duration and volume of trading. Xu, Zhang, and Liu (2014) investigated the short-term reaction of Chinese stock market due to the execution of trading halt and their findings suggest that positive events are more effective than the negative event for intraday halts and one day halt.

Furthermore, a stock split is used to regulate stock market transaction though it does not affect cash flow or capital structure of firms (Nguyen, Tran, & Zeckhauser, 2017). It results to abnormal returns after making the split announcement and its execution. It is further stated that stock split usually benefits insider traders where some investors use their voting power to promote stock split personal motives. Chou et al. (2005) found the existence of a higher trading volume surrounding the ex-split day. Similarly, Eng et al. (2014) study found the existence of a positive abnormal return in both the pre and post-split announcement periods. Contrary to the signaling theory postulation that stock split reduces/eliminates undervaluation, Karim and Sarkar (2016) found that stock splits are overvalued for seven years after their announcement. The signaling hypothesis states that a stock split is considered as a positive signal by investors as it conveys private information

to the market. Thus, the positive prospect firms use stock split to publicize important information to investors (Brennan & Copeland, 1988).

However, a stock split only creates/destroys a market value in an inefficient market. When the market is efficient, all relevant information is incorporated in the prices of securities. Elfakhani and Lung (2003) found that the split events results in positive abnormal returns and enhances liquidity. This is an indication that some investors perceive stock split as firms' positive financial prospects which influences stock prices. The share price increase due to stock split announcement can be interpreted as investors expectation of higher dividend in the future. Additionally, Beltratti, Bortolotti, and Caccavaio (2012) found that the Chinese split share structure reform exerts a positive impact on the less-attractive stocks with an increase in volume and prices.

Similarly, Charitou, Vafeas, and Zachariades (2005) found the existence of a positive abnormal return around the split announcement. The authors attributed the excess return to the response of irrational investors that do not evaluate correctly the burble after the event. The split announcement also increases firms earning performance due to investors positive reaction (Yagüe, Gómez-sala, & Poveda-fuentes, 2009). In summary, a corporate decision of splitting stocks has implication on the value of firms and the expected future earning in line with the overreaction hypothesis.

Another important regulation is the adoption of price limit which represents the upper bound and lower bound of equities where trading is usually suspended when the limit-hits

occur. This regulatory tool is used in equities and futures market to reduce price fluctuation. The findings of Deb, Kalev, and Marisetty (2017) suggests that the price limit successfully curbs transitory volatility on the post-limit days. In line with the overreaction hypothesis, Farag (2015) found that the imposition of price limit regime results in price reversal in the Egyptian Stock Market. This is an indication of how the market responds to a new regulation through price movement.

Similarly, the study of Lin, Ko, Lin, and Yang, (2017) suggests that the value premium is stronger among stocks with low-limit-hit frequency in the Taiwan Stock Market. The findings further reveal that the value premium has a distinct driving force in different markets. However, the findings of Kim and Rhee (1997) is against the price limit proponents which suggest that price limit is inefficient in countering overreaction and in reducing volatility in the Tokyo Stock Exchange. Similarly, Phylaktis et al. (1999) found that price limit has no impact on stock volatility in the Athens Stock Market which can be interpreted that investors panic behavior exacerbates market fluctuation.

Furthermore, it is argued that an initial public offering[8] (IPOs) play a vital role in the resource allocation regulated in all capital markets due to their economic importance. For the relationship between IPOs and financial regulation, some empirical findings suggest that securities regulation improves IPO survival and reduces unequal access to information (Cattaneo, Meoli, & Vismara, 2015 Ekkayokkaya & Pengniti, 2012; Burhop, Chambers, &

[8] Initial public offering/stock market launch has to do with companies offering of securities to public for the first time to raise investment capital. A first time offer of shares for sale to institutional and retail investors to be underwritten by one or more investment banks.

Cheffins, 2011; Cheung, Ouyang, & Tan, 2009). This is an indication that when securities markets are fairly regulated, the issue of IPO underpricing and other market imperfections can be reduced to a minimum level. In other words, security regulation circumvents the information gap between investors and firms in one hand and between issuers and the financial intermediaries on the other.

Secondly, it also signifies that the interest of shareholders is closely associated with a firm's potential to survive in business activities. Nevertheless, there is strand of empirical literature that suggest a negative relationship between IPO and stock securities regulation (Akyol et al., 2014; Doidge, Karolyi, & Stulz, 2010; Gao, Ritter, & Zhu, 2013; Shi et al., 2013). The negative relationship may not be unconnected to the excessive securities regulations that depress firms from going public which could further result in a decline of IPO survival rates.

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On the contrary, Ritter (2011) found that securities regulation does not contribute to United States IPO underpricing as a structural shift was a driven force that lessens the profitability of small firms. The author attributes the inability of regulation to explain IPO underpricing to the integration of the market as investors are less concerned with country-specific regulations since the market is relatively free from entry barriers. Recently, it has been concluded that the firms' acquisition activity in a market-based financial system is sensitive to IPO financing than firms from less-developed equity markets (Aktas, Andries, Croci, & Ozdakak, 2019).

Despite evidence of studies conducted on the relationship between regulation and stock markets, their findings are ambiguous and inconsistent. Secondly, different aspects of securities regulations are enacted and enforced in advanced countries ranging from fair disclosure regulations, investor protection laws, trading halt[9] and stock split[10] among others which have contributed to shaping the operations of stock markets. However, these laws are rarely found in Africa due to the low advancement of stock market on the continent hence the results cannot be generalized to the African region. Therefore, a further study is crucial to investigate how the regulatory quality contributes to the variation in stock market development with evidence from the selected countries as little effort is made to exploit the relationship, especially that the continent's stock markets do not recover from the aftermath of the 2008 global financial crisis.

2.5.2 Banking Development and Stock Market Development

Despite the conflicting theoretical predictions about whether stock markets and banks are substitutes or compliments[11], there is empirical evidence that supports the existence of a significant relationship between the two segments of a financial system. However, some of the evidences (Nyasha & Odhiambo, 2015; Ayaydin & Baltaci, 2013: Demirguc-Kunt & Levine, 1996) disclose a significant positive link between the banking sector development

[9] A trading halt/stock halt is a temporary pause in trading of a particular security in a developed financial market due to anticipation of a significant news that may have effect on a firm. This can be a regulatory development affecting company's ability to do business.

[10] A stock split is an announcement of a company's decision of adjusting (increasing or decreasing) total shares outstanding which do not alter a firm's market value. The action requires advance approval from the company's board of directors. In the United Kingdom, a stock split is referring to bonus issue or capitalization issue.

[11] See Beck (2010) for details of complementarity and substitutability hypotheses of financial market development.

and stock markets. The positive nexus supports a theoretical argument that banks and stock markets are complements of each other where the development of one tends to bring development of the other. In other words, countries with well-developed financial intermediaries also have relatively well-developed equity markets. It seems the increase in stock price signifies an increase in economic activities since stock market is a vital tool for gauging economic strength. In fact, the preference of holding more long-term assets by investors can be an incentive for banks to provide more liquidity to the financial market to boost investment. It can be presumed that bank participation can promote stock market development.

On the contrary, there are other empirical studies (Ho, 2017 and Yartey, 2008) supporting the theoretical argument that banks and stock markets are substitutes in providing financial services. The substitutability of banks and markets as sources of investment financing can be justified that, when firms issue new equities, its borrowing demand from the credit market can reduce to a greater extent. The substitutability hypothesis gives preference to either banks or stock financial markets as alternative financing sources in boosting economic activities. There is a line of argument that focuses on the superiority of financial markets over financial institutions. In his argument, Diamond (1997) states that an increased market participation mitigates activities of a banking sector. Comparably, Beck (2010) reveals that stock markets offer a better and more personalized set of risk diversification and hedging instruments/strategies than the banking sector. Hence a well-developed stock market lessens the principal-agent problem by aligning the owners and managers interest.

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In contrast, there is a line of argument under the substitutability assumption that favors banking sector development in accelerating economic growth. In his theory, Stiglitz (1985) evaluates how managers act with respect to handling shareholders' fund and concludes that stock markets lack incentives for accessing a firm's private information. Thus, the relationship between financial markets and banks during economic shock may worsen the instability in the economic growth process. Likewise, Diamond (1984) asserts that financial intermediation is necessary to address an agency problem when raising capital between lenders and borrowers. The study concludes that financial institutions allow better contract utilization and efficient allocation of resources. The empirical findings of Inoguchi (2013) suggest that a good number of firms in the East-Asian region rely heavily on bank financing to fund their investment proposal. Despite the significant contribution of bank lending to firms' investment, it is observed that the stability of equity market is necessary as market fluctuation threatens investment of many firms (Ibrahim, 2006; Ibrahim & Ahmed, 2013).

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The stock market-banking sector interaction can be further observed through the reaction of markets to bank loans. In fact, the aftershock of the 2008 global financial crisis reflects a need for a healthy credit-equity market interaction. The model of Banerji and Basu (2017) evaluates the interaction between universal banking and stock market crash and predicts that information friction due to a bank conflict of interest could be detrimental to stock market returns. The study further uncovers that since banks do have access to private information and the outcome of its funding, they foresee a potential success or failure of projects. Li and Ongena (2015) investigate how corporate borrowers react to bank's loan announcement in the United States and found that the impact depends on the business

cycle. That is, an excess return was documented after the 2008 financial crisis period while the return in the pre-crisis period was close to zero.

On the contrary, some studies (Almutai, 2015; Bailey et al., 1999; Metiu, 2016) found a negative relationship between bank loan and stock market returns attributing it to the creditworthiness and motive of borrowers. Therefore, the informationally underprivileged equity market investors cannot differentiate between the good and bad borrowers which suggest the need for an effective project certification and scrutiny before granting approval.

Although Boot and Thakor, (1997) assert that financial system is bank dominated in its infancy, there are studies that consider the two segments (banks and stock markets) as independent of each other in the growth process. For example, Song and Thako, (2010) opine that due to the different comparative advantage of markets and banks, they compete only when they are seen in solitude. Similarly, Fufa and Kim (2018) and Chang and Mendy (2012) reveal in their separate studies that stock markets and banks play a different role in providing financial services to investors in the growth process. In fact, in a bank-based financial system, banks keep engaging in capital market activities as a diversification strategy due to the underdevelopment of the latter. Contrary to the above assertion, the study of Osoro and Osano (2014) suggest a long-run interaction between the evolution of financial markets and banks in Kenya.

A further review uncovers that diversification sends a reputational signal for tempting more investment opportunities. de Sousa, Beck, van Bergeijk and Van Dijk (2016) reveal that

despite the prevalence of immature financial system dominated by banks in some low- and middle-income economies, a liquid financial market with a potential for diversification can lure firms and investors' participation. After examining the link between bank diversification and stock markets, Baele, De Jonghe, and Vander-Vennet (2007) found that a functional diversification is responsible for boosting the market value of equities. This is an indication of how effective the link between risk exposure and asset diversification as stock markets react to the diversification of investment.

Another finding (Edirisuriya, Gunasekarage, & Dempsey, 2015) suggest that due to diversification, private sector banks made a significant contribution to market liquidity and capitalization of some South- Eastern economies. Conversely, Vo (2017) found that the stock market value and bank diversification in Vietnam are negatively related. Thus, considering the risk implication of bank diversification, the above study concludes that investors prefer banks that emphasize on the traditional banking services.

The previous empirical literature is mostly from advanced economies and they reveal inconsistency in their findings. There is little effort to examine empirically how banking development relates to the stock market in the African region, especially using panel evidence. In fact, the recent literature is less conclusive on the issue of stock market-bank interaction. The question to be addressed is should the emphasis of capital transfer from savers to investors be placed on banks or financial markets? This study contributes to filling the existing literature gap regarding the African bank-stock market development nexus.

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2.5.3 Life expectancy and Stock Market Development

The average number of years households are expected to live plays a vital role on their productivity and the entire economic growth. Therefore, a certainty of longevity reduces present consumption and induces investment with a prospect of an increase in future earnings. It is found that a rise in life expectancy is an indication of an enhancement in the welfare of citizens (Hickson, 2009). Although most of the African countries do not give emphasis on investment in the health care with a substantial decrease in health expenditure (Adeniyi & Abiodun, 2011), investment in health sector will go a long way in enhancing the living condition and life expectancy of the citizens. Ajide (2014) and Mahumud et al. (2013) postulate that a rise in health care services and public enlightenment will promote individual's life expectancy.

Despite studies directly on the relationship between life expectancy and the stock market are inadequate, there is empirical literature on how life expectancy affects economic growth. For example, an increase in life expectancy reduces the growth if bequests are operative (Kunze, 2014), healthier individuals that anticipate longevity are more able to invest in human capital (Hansen, 2013), increased life expectancy has a significant positive relationship with economic growth (Ecevit, 2013; Hami, 2016; Jayachandran & Lleras-Muney, 2009). This underscores the vital influence of life expectancy towards improving the level of investment and economic growth. Therefore, diversion of resources from the production to healthcare can be justified through an increase in life span to promote higher savings and capital accumulation (Kinugasa & Mason, 2007).

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Moreover, a poor health condition is having an effect on life expectancy with implication on future investment. That is, a good health condition is an important component of human capital that contributes to the national income through an acquisition of quality education and skills. Evidently, a decrease of mortality rate through channels of fertility and schooling promotes growth (Kalemli-ozcan, 2002), induces savings for retirement with increased investment (Weil, 2007). Needless to say, however, it is established that the high cost of medical treatment and poverty contribute to the spread of infections and a rise in casualties (Ojeaga, 2014). Therefore, a poor health condition leads to a fall in productivity due to low propensity to learn and adjust to a new technological advancement (Ngangue & Manfred, 2015).

In contrast, a rising longevity leads to an aging population which raises anxiety about its economic effect. It is found empirically that an increase in old age dependency ratio can lead to a rise in tax burdens causing slowdown in future growth (Kunze, 2014), it leads to a fall of income per capita (Acemoglu & Johnson, 2007) and it can reduce the ratio of active labor (Choi, 2017). Furthermore, the findings of Aghion, Howitt, and Murtin (2010) suggest that individuals with a higher life expectancy are likely to invest more in their education which positively affects economic growth.

Despite existing evidence of the impact of life expectancy on economic growth, its implication on the stock market is not addressed in empirical literature. Thus, understanding how stock market responds to changes in life expectancy is necessary. There is a need for an empirical study to investigate whether life expectancy contributes to stock

markets in the African region. This study has contributed to filling the gap by empirically examining the impact of life expectancy on the stock market development in the selected African countries.

2.5.4 Poverty Reduction and Stock Market Development

Poverty is a critical factor prevalent in the African region with more than half of the population living below the poverty line. This is a serious setback that might have contributed in retarding the domestic investment (Akwara et al., 2013; Ojeaga, 2014). If poverty level and other associated socioeconomic factors are addressed, the Africans would have an opportunity to save a portion of their income which can be translated to investment in stock markets. However, there is no prior panel study that investigates the effect of poverty reduction[12] on stock market development. On the general note, the previous studies were on how stock market development (financial development) contributes to the poverty reduction.

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Poverty is considered among the crucial investment risk factors affecting households, firms and economic development. Thus, Beck and Levine (2004) observe that countries with well-developed financial intermediaries experience a speedy reduction in poverty. There are studies that unveil a global increase in poverty level and inequality. For example, it is observed that only five percent (5%) of the United States population holds about seventy-five percent (75%) of the entire equity investment (Sawhney & DiPietro, 2006). Similarly,

[12] See Beck et al (2007) for a possible theoretical link between poverty reduction and financial development.

statistics have shown that the richest 10% of the entire world population holds 71% of the total global wealth as of 2007 (Favilukis, 2013).

Moreover, the recent report from the World Bank states that Sub Sahara Africa is home of at least 30 percent of the world poorest people and Africa has six out of ten most unequal countries in the world (World Bank Group, 2015). According to Ojeaga (2014), Africa has the highest population living below the poverty line which is posing a serious setback to the region's economic stability and development. In view of the above contagion, Seven and Coskun (2016) suggest for a global response to poverty reduction to attain an effective income distribution and sustainable economic growth.

Due to inadequate studies on how poverty reduction predicts stock market development, this study reviewed literature on the effect of financial development on poverty reduction. For example, there is evidence suggesting an inverse relationship between the financial development and poverty reduction (Boukhatem, 2016; Khan, Khan, Ahmad, & Siraj, 2011; Batuo, Guidi, & Mlambo, 2010; Beck et al., 2004; Boukhatem, 2016; Clarke, Xu, & Zou, 2006; Demirgüç-Kunt & Levine, 2009; Odhiambo, 2009). Thus, it can be assumed that when the nations attain a certain level of financial development, the financial intermediation can be extended to the poor households while access to finance will go a long way at improving their standard of living, economic stability, and subsequent poverty reduction.

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Moreover, the other empirical literatures consider the possibility of financial development benefiting only rich and well-connected individuals in the society at the expense of the poor households (Adams & Klobodu, 2016; Das & Mohapatra, 2003; Jauch & Watzka, 2015; Kunieda, Okada, & Shibata, 2014; S. Naceur & Zhang, 2016). The positive relationship may not be unconnected to unequal access to financial services between the rich and the poor as the former get richer and the poverty level becomes unacceptably high. The second reason may be that most of the financial intermediaries prefer investment in riskless asset thereby giving less priority to individual and firms financing request. Sun, Sen, and Jin (2013) assert that poor households with tight financial constraints could not invest in their children education leading to an intergenerational poverty. Therefore, increasing access to financial resources will magnify economic prospects for the less privileged to fund investment of their children.

Furthermore, some empirical literature reports a non-linear relationship between the variables. For example, Rashid and Intartaglia (2017), Kim and Lin (2011), and Beck, Demirgüç-Kunt,and Levine (2007) suggest that the financial development can reduce poverty only when there are strong regulatory and institutional frameworks. Similarly, Prete (2013) uncovers that the effect of financial development on poverty reduction is driven by economic literacy. The ability to explore new investment opportunities will indisputably lead to poverty reduction and investors' competence is one of the critical factors that will result in a success of business operations. By contrast, Dhrifi (2013) and Odhiambo (2010) uncover that it is the financial development and savings that contribute to poverty reduction.

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Despite the empirical evidence on the existence of a significant relationship, other studies suggest that financial development has no significant impact on poverty reduction (Seven & Coskun, 2016; Fowowe & Abidoye, 2012; Tan & Law, 2012). These studies emphasize that inactive financial markets hamper growth opportunities and amplify the scourge of poverty. Notwithstanding the structural adjustment programs resulting to a rise in demand for financial services in developing countries, this request has not been well considered by financial market to supply finance in proportion to the increase in demand.

In summary, most of the existing studies are on the direct relationship between financial development and poverty reduction. Understanding the empirical link between poverty reduction and stock market development will let the policymakers assess whether poverty level in Africa is a contributing factor to the low development of the stock markets.

2.5.5 Unemployment and Stock Market Development

The previous literature confirms no consensus on how unemployment and stock markets are related. The announcement of a rise in unemployment can have a greater effect on behavior and movement of stock prices. Birz and Dutta (2016) assert that the employment/unemployment news announcement is among the most crucial announcements affecting the stock markets. In fact, the persistent rise in unemployment usually diminishes investors' confidence and creates panic with the expected change in interest rates which traditionally, have a negative effect on stock returns.

However, the existing empirical studies provide inconclusive evidence on the relationship between the stock market and unemployment. Some studies found evidence of a causal

relationship between the variables (Kilic & Wachter, 2016; Medovikov, 2014). These studies show a unidirectional causality from stock market to unemployment. It is the variation in stock markets that determine the level of unemployment. As market return increases, it will bring about business expansion and this may need additional manpower to handle new areas which could reduce the level of unemployment. Additionally, Holmes and Maghrebi (2016); Fritsche and Pierdzioch (2016) and Rahman (2009) studies suggest a positive link between stock market fluctuation and unemployment rate. Intuitively, the stock market is forward looking because an expectation about future is mirrored in the equity prices and any deviation from such anticipation results to market volatility.

Furthermore, some literature found the existence of a positive relationship (Belo et al., 2014; Ganzalo & Taamouti, 2014; Malley & Moutos, 1997; Loungani et al., 1990; Gertler & Grinols, 1982). The studies suggest as unemployment news is made public, there is an expectation that the government will cut down interest rates which leads to an increase in the future cash flows and stock market returns. On the contrary, a significant negative nexus is reported between stock returns and unemployment (Ilo, 2015; Gatti & Vaubourg, 2012; Taulbee, 2001; McQueen & Roley, 1993). These studies argue that as unemployment news is made available, it may create panic in public and reduce the investors' confidence, leading to a reduction in future equity returns. The second argument is that rising unemployment leads to a decline in demand for goods and services which reduces revenue and profit leading to a fall in stock price.

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Although the link between stock market and unemployment is one of the major research areas in financial economies, some studies could not find evidence of a significant relationship between the variables (Farsio & Fazel, 2013; Poitras, 2004; Tapa et al., 2016). These studies conclude that unemployment data may not help investors in predicting future returns as they are independent of each other. The above evidence suggests a weak-form efficient market, and this makes an unemployment news announcement irrelevant as far as the future stock price is a concern.

However, Farmer (2015) found evidence of a significant link between unemployment and the stock market crash in the United States. The author further discloses that the level of unemployment in the U.S. rises as a result of the contagion that spreads to the global market affecting many nations in different aspects. Additionally, mixed findings are reported on the relationship between the variables in business circle period. Cakan (2010), Bestelmeyer and Hess (2010) and Boyd, Hu, and Jagannathan, (2005) found significant positive link during economic expansion and negative in the recession period.

Further review uncovers that the relationship between the United States unemployment news and international stock prices are found to be statistically significant (Birz & Dutta, 2016; and Lahaye et al., 2011). The findings support an argument that domestic economic news would have an effect on international stock prices. Therefore, it is plausible to state that the United States economic factors comprise global economic information affecting stock markets as a trading partner for many countries in the globe.

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Although some economic news may not be useful in predicting market returns, the U S. unemployment news is among the most critical factors that can cause changes in the global capital market. It is the interdependence between the United States and the global market that spread the shock of the 2008 global financial crisis to the world with a varying level of damages. Additionally, the financial liquidity of firms can contribute to their level of employment and other market activities as Rocheteau and Rodriguez-Lopez (2014) found evidence of a statistically significant positive link between financial squeeze and job creation. This signifies that the financial squeeze hinders the creation of permanent jobs for small companies that seem to be productive. Intuitively, an active financial market creates employment opportunities as job seekers will be engaged by the economy and this will have a long-run positive impact on companies' productivity.

However, the empirical findings on how unemployment relates to the stock markets are very scarce in emerging economies. Most of the available literature on the unemployment-stock market relationship is done in the United States market and other developed economies that accomplish all aspects of economic development. Therefore, linking those studies to the present study may not be feasible. In other words, an adaptation of the results from the industrialized economies to the present study which focus on Africa may not be rational since there is a very wide gap in terms of development. Hence, this study attempts to bridge the existing literature vacuum by investigating whether a high level of unemployment in the African countries predicts the development of African stock markets.

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2.5.6 Export Growth and Stock Market Development

The production capacity of firms participating in foreign markets may be affected by their export performance. As the volume of export rises, it is expected to have an impact on the future cash flows and profitability of the exporting firms. Due to the financial constraints, many firms could not produce in large quantity for both domestic and export demand. The exporting firms' access to financial services will encourage them to engage in a large-scale production which could further result in a high volume of sales and revenue. In other words, stock market development increases a firm's disposition to foreign transactions.

Theoretically, Kletzer and Bardhan (1987) predict that financial development enhances export intensity for individual firms seeking external financing. There are empirical literature supporting the above relationship with conflicting findings. Most of the studies centered on the financial status of firms participating in foreign markets. Unlike the domestic production and sales, firms that are willing to export are expected to pay the extra fixed cost (sunk cost) which constraint many of them due to their illiquidity to cover such expenses. For example, Coban (2015) asserts that the level of a nation's financial development can increase firm's willingness to produce for foreign trade while other studies confirm that financial and credit-constrained firms are having limited access to export and international transactions (Amiti & Weinstein, 2011; Berman & Héricourt, 2010; Feng & Lin, 2013; Wagner, 2014).

Therefore, it is straight forward to contend that a worsening financial condition reduces firms' export potential which could further affect their future revenue generation. This

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signifies that financial development has a strong causal impact on export and trade balance as more liquid firms situated in financially less-developed countries record a high volume of export (Fauceglia, 2014).

Moreover, there are studies that found financial development predicts the future growth of firms' export (Beck, 2003; Minetti & Zhu, 2011; Rajan & Zingales, 2008), it impacts positively on their export technical sophistication (Fang, Gu, & Li, 2014) while a new exporter has a lower financial stability. The studies revealed that financial development is a crucial factor that explains the firm's ability to engage in foreign export. This also shows that due to additional expenses, exports are highly contingent on finance rather than on domestic sales.

Consequently, the existing literature mostly focused on the impact of financial development on export performance in the industrialized nations. There is scant literature on causal link between the variables. It can be assumed that as a firm's level of export increases, it can impact positively on its earnings and future equity prices. This study investigates the impact of export growth on the stock market development using panel data evidence from the selected African countries.

2.5.7 Control Variables and Stock Market Development

Studies on the stock market have been on the increase signifying its historical importance for growth and development. Several empirical studies were conducted on the link between the stock market and other economic variables from both time series and panel evidence. The general variables that were found to have contributed to a variety of stock markets

include but not restricted to the exchange rates and interest rates. The empirical literature on the relationship between the stock market and the aforementioned variables were conducted showing the existence of a significant relationship. Therefore, this study will control for their effect on stock market development.

2.5.7.1 Exchange rates and Stock Market

The nexus between exchange rates and stock market reveal both theoretical and empirical ambiguity. The flow-oriented approach and the portfolio adjustment approach are the two fundamental theories linking exchange rates and stock prices. According to the flow-oriented approach, an exchange rate depreciation would affect stock prices by increasing the firm's competitiveness which in turn, raises their profitability (Dornbusch & Fischer, 1980). Since stock price is a present value of future cash flows, an exchange rate fluctuation affects international competition via variations in real income and output which in turn affects the stock return hence exchange rate causes changes in equity prices.

On the contrary, the portfolio adjustment approach conjectures that an increase in stock price implies a growing demand for country's assets which would cause the domestic currency to appreciate against the foreign currency due to the foreign capital inflow. Therefore, a reduction in equity price decreases the domestic investors' wealth which thereafter lowers demand for money resulting to lower interest rates. The declining interest rates discourage foreign capital inflow and cause a currency depreciation. Hence, the portfolio balance model states that it is the stock price that causes the variation of exchange rates (Branson & Henderson, 1985).

Generally, empirical studies reveal inconsistency on the relationship between the exchange rates and stock prices. For example, some studies (Abdalla & Murinde, 1997; Fowowe, 2015; Huang et al., 2008; Jebran & Iqbal, 2016; Senturk & Ducan, 2014) found an existence of a unidirectional causality from exchange rates to stock prices supporting the view of the flow-oriented model that exchange rates lead stock prices. This shows that an exchange rate is the leading variable and is essential for the policymakers to give emphasis on its stability. However, there is empirical evidence (Bonga-bonga & Hoveni, 2013; Koseoglu & Cevik, 2013; Oyinlola, Adeniyi, & Omisakin, 2012; Alhayky & Houdou, 2009; Stavárek, 2005) suggesting in line with the stock oriented model that, it is the stock market causing changes in exchange rates. Thus, a change in stock prices will have an impact on the movement of foreign capital which further results to increase/decrease in demand for domestic currency.

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2.5.7.2 Interest Rates and Stock Market

Understanding a link between interest rates and stock market becomes an issue generating an extensive analysis. Since the stock and bond markets are alternative vehicles that provide finance for investment, it is necessary for investors to decide on which of two sources of financing to be utilized for investment. Notwithstanding stock markets are seen as a vital segment of the financial system for the growth and development of nations, they are affected by both internal and external factors. An interest rate is found to be an important monetary policy tool affecting the asset prices (Bernanke & Kuttner, 2005).

There are conflicting findings on the relationship between interest rates and stock markets where some studies show a significant negative relationship between the variables (Alam & Uddin, 2009; Amarasinghe, 2015; Eita, 2014; Khursheed et al., 2014; Laopodis, 2012;

Moya-Martínez, Ferrer-Lape, & Escribano-Sotos, 2015). Traditionally, when an interest rate is adjusted upward, the investors switch from the stock markets to banks and their movement can cause a decline in the stock price. Conversely, when the rate declines, they move their money from savings to stock markets in anticipation of a better return.

Furthermore, other studies (Czaja, Scholz, & Wilkens, 2009; Korkeamaki*, 2011; Kulathunga, 2015; Papadamou, Sidiropoulos, & Spyromitros, 2016) disclose that an effect of interest rate drops afterward as a result of improvement in techniques for managing interest rate risk among other important factors. Another strand of literature (Volpert, 2013; Ferrer 2010; Czaja et al., 2009) reveals that the response of stock price to interest rate depends on the maturity period as long-term rates can cause more variation on equity price than the short-term interest rates. For example,, it is found (Kganyago & Gumbo, 2015; Panda, 2008) that the short-term interest rate has a positive link with the stock market return. The authors' justification for the short-term positive relationship is that if the interest rate rises due to rapid economic growth, the economic expansion could also raise the firms' earnings which move stock prices upward.

On the contrary, Tibebe, Assefa, Esqueda, and Mollick (2017) study suggest mixed finding as there is a negative relationship for developed countries while the world market portfolio is found to be the sole determinant of stock prices in emerging countries. The authors attribute the conflicting findings partially to different monetary policies and the advancement of the markets. In spite of a significant link suggested, other studies suggested

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that interest rates do not contribute to changes in stock prices (Akpan & Chukwudum, 2014; Yang, 2013).

2.5.7.3 Financial Crisis and the Stock Market

The financial crisis of 2008 caused a severe loss of investment and a sharp decline in international portfolio diversification for many countries. Although the financial market integration allows foreign investors a chance to diversify their risk and maximize returns across borders, the previous literature reveals the contagious nature of the financial crisis to global economies. For example, it was argued that the 2008 global financial crisis (GFC) exposed the fundamental weakness of the global financial system (Nanto, 2009), it is seen as the most turbulent economic event in recent history (Kenourgios, Naifar, & Dimitriou, 2016), it leads to a dramatic economic shock in the world financial market (Morales & Andreosso-O'Callaghan, 2014) and it was seen as the worst of modern times causing a severe decline of the world stock market valuation by almost one half (Loser, 2009). It can be deduced that the last financial crisis led to a structural shift in the financial market and the entire global economy causing a lot of tension and investment loss.

However, the impact of financial crisis was largely attributed to a high dependence on foreign capital flows by many economies. Kenourgios et al. (2016) assert that stock markets constitute a strong transmission mechanism in a period of financial disorder. Similarly, Sugimoto et al. (2014) postulate that the intra-regional financial interdependence was negatively affected during the crisis. Despite numerous intervention strategies to contain the transmission of the crisis and to induce economic recovery and restore investors' confidence in the financial markets, the global economy was threatened with the

harshness of a macroeconomic downturn and a widening capital flight. The sharp decline in stock market return reflects a change in investors' expectation in the financial market and cause a divestment in the respective economies. This calls for an urgent financial system overhaul to mitigate risk and avert future occurrence.

Moreover, before the crisis, the value of real and financial assets grew without perceptible limit. This is ascribed to the pursuance of export-led-growth strategies and a sharp rise of commodity price especially for the oil exporting countries resulting in large current account surpluses and external reserve buildup. Nevertheless, the self-insurance packages taken by many countries could not save them from the contagion of the crisis which results to the sharp decline of foreign portfolio investment, its transmission to real sector and rising unemployment due to the economic downturn. Blanchard, Das, and Faruqee (2010) argued that the collapse of trade and the decline of financial flows in the crisis period are among the most important transmission channels to other countries.

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It is noteworthy that an increase in perceived risk leads to nosedive of capital flows when proper measures are not taken. Moreover, Ivanov, Kabaivanov and Bogdanov (2016) and Luchtenberg and Viet (2015) report that an unstable economic fundamentals and investors risk aversion contribute to the transmission channels and to the slow in market recovery. This is an indication that asset prices move together when financial markets are integrated.

However, the investors' confidence is crucial as far as the development of financial market is a concern. Its decline will further have a negative effect on their spending and risk-

taking. Therefore, effective and sound financial policies will go a long way in restoring the confidence of investors. Sum (2013), notes that a business and consumer confidence are critical factors that affect stock market returns while Massa (2009) asserts that the investor's confidence in the African stock markets is continuously degrading, Similarly, Boamah, Watts and Loudon (2017) state that the high liquidity risk confronting the African countries is a major source of worry to the investors seeking diversification in to the region.

Thus, the investment decision is generally taken under risk associated with the probability of getting a return (Urbšienė et al., 2016). Ali and Afzal (2012) affirm that the net capital inflows from the advanced to emerging nations decline significantly from the beginning of the crises. These studies uncover how financial markets in most developing and emerging economies were affected due to their strong tied to the global trade. Morales and Andreosso-O'Callaghan (2014) disclose that the GFC hit the African countries as the foreign investment; financial aid and workers remittance that are major sources of income to the region declined sharply.

Moreover, an uncertainty in the minds of investors further aggravates the adverse effect of the crisis on the African portfolio diversification. Beck et al. (2011) observe that the African capital market experienced a rapid decline in capital flows which dampens the stock market indexes throughout the continent and constraints both government and firms to cancel bond and stock issues. An uncertainty generally intensifies economic disorder and heightens the stock market investment risk (Tsai, 2017). Consequently, the business firms in Africa hardly raise capital from their stock markets which makes them resort to

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short-term loans with high-interest charges by the deposit money banks. Kazarwa (2015) observed that the inability to expand and increase business portfolio dampens firms return on investment and limits the number of listed firms in the securities market. This supports the Mensah and Alagidede (2017) assertion that the international portfolio diversification is stalled when the financial markets are in a crisis period.

Furthermore, the empirical literature shows inconsistencies regarding a link between the GFC and stock markets. For example, Anagnostidis, Varsakelis and Emmanouilides (2016) investigate how the financial crisis relates to market efficiency and report that the herding behavior of market agents leads to unusual price fluctuation and market inefficiency. Similarly, Mensi, Tiwari and Yoon (2017) findings suggest that Islamic stock returns are more efficient in the long term than in a short period. This indicates that in an efficient market, price prediction is difficult if not impossible. Additionally, Kenourgios et al. (2016) found that the Islamic equities and bonds provide a hedge against risk and instability in the crisis period. Other findings uncover that the GFC exert a negative impact on Pakistani and Indian Markets (Ali & Afzal, 2012), and on the level of integration between the US and Indian markets (Gangadharan & Yoonus, 2012).

The existing empirical evidence further discloses the negative effect of GFC on different markets with a varying level of damage to firms and economies. For example, Wang (2014) shows the East-Asian stocks are less responsive to shocks in the US after the crisis while Jin, Luo, and Wan (2018) findings uncover that stronger financial constraint firms respond sluggishly to recovery than the weaker constraint firms. On the contrary, Boako

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and Alagidede (2018) investigates the decoupling and recoupling of the stock market in the GFC period and found the regional spill-over is higher than the global spill over. Wang, Xie, Lin, and Stanley (2017) suggest that a cross-market correlation from the US to G7 and BRIC countries depend on the time scale.

Needless to say, however, the review indicates how the 2008 GFC was transmitted from the United States to the developed, emerging and developing countries through financial markets and institutions coupled with an increase in risk, uncertainty and decline of investors' confidence and market returns. In contrast to the existing literature that focuses on advanced and non-African countries, this study extends this line of research by examining how the 2008 GFC affects the African countries since it is still not clear empirically the devastating effect and predictive power of the GFC on stock market development in the region. Therefore, Table 2.1 below depicts the summary of selected previous empirical works for this study.

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Table 2.1
Summary of Selected Empirical Studies

Author/Year	**Country/Data**	**Model/Method**	**Variables**	**Findings**
Aktas et al. (2019)	European Countries	Pooled Ordinary Least Squares (POLS)	Inflation, GDP growth, Acquisition dummy	The purpose of IPO financing varies with the degree of stock market develop.
Fufa and Kim (2018)	64 countries	Generalized method of moments (GMM)	Market cap. Bank credit Inflation GDP	The link between financial dev. and economic growth depends on stages of economic growth of countries.
Chauhan and Kumar (2018)	630 Indian firms	Pooled OLS	Firm value Long term bond Firm size Disclosure	The non-financial disclosure is more valuable to stand alone firms compared to group business firms
Nguyen et al. (2017)	Vietnam firms	Panel regression	Share price Pre-announcement market return, post announcement return	Trading volume of firms increase prior to split announcement date.

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Ho (2017)	Malaysia	ARDL model	Market Cap. Bank credit Inflation GDP per capita	Banking sector development has a negative long run impact on stock market develop.
Vo (2017)	Vietnam	Vector autoregressive model (VAR)	Stock returns Trading volume Investors exposure	Foreign investors are positive feedback traders in Vietnam stock market
Choi and Chue (2017)	G7 and 26 OECD countries	Subsampling approach	Exchange rates Stock prices	The findings are in line with the purchasing power parity hypothesis
Hami (2016)	Iran	Vector Error Correction Model (VECM)	Life expectancy Annual GDP growth rate.	Economic growth has a positively significant effect on life expectancy.
Seven and Coskun (2016)	45 emerging countries	GMM	Market capitalization, bank credit, annual GDP, poverty head-count ratio.	Neither banks nor stock market play a significant role in poverty reduction.
Naceur and Zhang (2016)	143 countries	Instrumental Variable (IV) and POLS	Poverty gap, financial development, Real	Banking development has a more significant

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			GDP, Government expenditure, trade openness	impact on changing income distribution than stock market.
Holmes and Maghrebi (2016)	United States	GARCH-in-mean-VAR model.	Stock market return, unemployment rate, nominal rate	Stock market volatility impacts positively on unemployment
Tapa et al. (2016)	South Africa	Linear cointegration approach	Stock market returns, unemployment rates	Unemployment rate has no significant impact on stock returns.
Jereno and Negrut (2016)	United States	POLS	Stock prices, unemployment rate, consumer price index	The stock market exhibits a negative and significant relationship with the unemployment
Ng et al. (2015)	Cross-section of 85 countries	Threshold regression technique	Stock market size, minority shareholders protection, GDP per capita growth.	Stock market exerts a positive effect on growth when there is a strong minority shareholders protection.
Nyasha and Odhiambo (2015)	South Africa	ARDL model	Stock markets, bank credit, savings, GDP, investment.	There is evidence of unidirectional causal flow from bank-based

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				financial development to stock market in short run.
Ngangue and Manfred (2015)	141 developing countries	Fixed effect regression and GMM.	Gross national income per capita, life expectancy, good governance.	Improvement in life expectancy positively affects economic growth
Ilo (2015)	Nigeria	VECM	Stock market capitalization, unemployment, exchange rates	The growth of stock market has no significant impact on reducing unemployment
Coban (2015)	101 manufacturing firms	Dumitrescu and Hurlin panel Causality test.	Stock traded value, private credit, export performance.	The development of stock market plays a significant role in increasing export performance
Farmer (2015)	United States	VECM	Unemployment rates, stock market crash	Stock market Granger-caused unemployment rate.
Xu et al. (2014)	China	Non-linear least squares regression	Absolute returns, trading volume and bid ask spread	Intraday halt impacts significantly on absolute returns

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				and trading volume.
Fowowe and Abidoye (2012)	Sub-Saharan Africa.	System GMM	Financial development, poverty, inequality	Financial development has no significant effect on poverty reduction

2.6 Gaps in the Literature

Based on the related literature reviewed, this study discovered essential gaps that require further empirical investigation. The first gap relates to the practical gap identified after making a comparison between the African stock markets and the ASEAN5 stock exchange. The study found the average market capitalization; turnover ratio and the stock traded value[13] of the African stock market remain far below what is obtainable in other emerging countries such as the ASEAN5 region. Thus, the poor development of the market confirms the assertion of some previous literature (Asongu, 2012; Assefa & Mollick, 2014; Hearn & Piesse, 2010) that the African stock exchanges are smaller and illiquid with less information efficiency compared to other emerging stock markets.

The second gap relates to existing proxies used in representing stock market development. The previous literature (Aduda et al., 2012; Arize et al., 2017; Chipaumire & Ngirande, 2014; Demirgüç-Kunt et al., 2012; Law & Tan, 2009) mostly utilized a single proxy (either

[13] See El-Wassal (2013) for a detailed discussion of stock market development indicators.

market capitalization, turnover ratio or the stock traded value). A single proxy cannot accommodate other activities as the market is characterized to be multidimensional in nature. The capitalization indicates the market size while both the stock traded and turnover ratios are indicators of market liquidity. However, as argued by Levine and Zervos (1998) and Levine (2005), using each of these indicators separately has a shortcoming and does not represent an entire development of markets. The authors contend that a large market (capitalization) may not necessarily be a liquid market because a large inactive market has the large capitalization but small turnover. Similarly, a small liquid market can have a high turnover but small traded value. Thus, aggregating the main indicators using a composite index provides a richer picture of a stock market development.

Thirdly, the previous literature mostly concentrates on the general macroeconomic determinants of stock market development with inconsistency in their findings. For example, the relationship between exchange rates and stock market are in two categories. There are studies (Fowowe, 2015; Jebran & Iqbal, 2016; Senturk & Ducan, 2014) that found a unidirectional causality from exchange rate to stock price in line with the prediction of the flow oriented model. On the other hand, Oyinlola et al. (2012) and Stavárek (2005) studies found it is the stock price that causes movement of exchange rates in support of the stock oriented model.

The inconclusiveness of the existing literature also affects the relationship between interest rates and stock markets. For instance, Amarasinghe (2015), Eita (2014) and (Alam & Uddin, 2009) found a negative link between interest rates and stock markets while

Kganyago and Gumbo (2015) and Panda (2008) studies uncover a positive relationship between the variables. The authors conclude that the positive link was due to the economic prosperity that moves the interest rates, firms' earnings and stock returns in the same direction. Conversely, another strand of literature reveals that a movement of interest rates does not have any significant impact on stock prices (Akpan & Chukwudum, 2014; Yang, 2013).

Fourthly, despite the numerous literatures on the general macroeconomic determinants of stock market development, there are other important factors/variables that can predict the development of the market. The African region has been encountering challenges that include poverty, unemployment, weak and inconsistent market regulation, the dominance of banking sector in the region's financial system, diseases and a shorter life expectancy and poor performance of the export sector. Nevertheless, little attention is given in the extant literature regarding the empirical link between the above-mentioned factors and stock market development. Consequently, answering these policy questions can boost the economy of the region by attracting more investment opportunities and improving the low development of stock markets.

The fifth identified gap is regarding the contextual literature gap where some studies (Billmeier & Massa, 2009; Hajilee & Al Nasser, 2014) combine countries belonging to different background and regions and made their conclusion regardless of the heterogeneous nature of the countries which could be difficult to have a uniform policy framework. Thus, it is indispensable to carry out a panel study using data from countries

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sharing similar characteristics such as African economies so that the policymakers of the region can implement policies to improve the entire financial market environment, restore investors' confidence and propel stock market recovery from the aftershock of the 2008 global financial crisis.

Lastly, this study identified another gap relating to the methodology. The existing studies (Babayemi et al., 2013; Cherif & Gazdar, 2010; Naceur, Ghazouani, & Omran, 2007) were mostly carried out based on the traditional/static panel models of pooled ordinary least squares (POLS) regression, the fixed effect (FE) and Random effect (RE). Another set of studies (Adjasi & Biekpe, 2009; Andrianaivo & Yartey, 2010) employ the generalized method of moments (GMM) in their modeling. Although the GMM is a dynamic panel model, it is not suitable for the present study that has a higher number of years than the cross-section. Thus, the pooled mean group (PMG) is the suitable model which addresses the problem of longer time fewer cross-sections. This study investigates the impact of regulation, banking development and selected economic forces on stock market development in the selected African countries.

2.7 Chapter Summary

The review unveils studies on the determinants of stock market development. Their findings are inconsistent and are far from being conclusive where less attention given to the banking development, regulation, poverty reduction, unemployment, life expectancy and export growth variables. The interaction of the above-mentioned series with the stock market development is considered a contribution to filling the existing literature gaps. It can open up new opportunities to the region's financial market to favorably compete with

the other emerging financial markets and restore/enhance the declining investor confidence. Moreover, the chapter highlighted the concept of stock market development and discussed theories and models of stock markets such as Arbitrage pricing theory (APT), the Macroeconomic Factor Model, the Life-cycle hypothesis and the Financial Development Theories.

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CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research methodology and gives an elaboration on the sources of data used in this study, unit of analysis and the statistical tools employed in the empirical analysis. Furthermore, it discusses the theoretical framework used in formulating the model which explains the relationship between stock market development and the explanatory variables.

3.2 Data and Sampling

This section provides the sources of data used as well as the African countries that form the sample size of the study to investigate how regulation, banking sector development and selected economic forces predict stock market development.

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3.2.1 Unit of Analysis

The unit of analysis is 12 African countries selected based on data availability. This study used composite index to proxy for stock market development while the annual data is from 1996-2016 making 252 numbers of observations.

3.2.2 Sources of Data Collection

The data for this study is annual secondary data retrieved from the independent and relevant agencies to examine the effects of regulation, banking development and economic factors on stock market development in the selected African countries. As stated earlier, this study

employs composite index that incorporates three indicators (market capitalization, turnover and the stock traded) to proxy for stock market development. All the variables data are collated from the World Development Indicators (WDIs, 2016), World Governance Indicators (WGIs, 2016) and the Financial Market and Institutions databases.

3.2.3 Sampling

Africa is the second most densely populated continent that covers almost 20% of the total land surface of the earth with 54 countries and 5 different regions. The regions are North Africa, Southern Africa, East Africa, West Africa and Central Africa. Table 3.1 depicts the selected African countries, their respective stock exchanges and year of establishment forming the sample of this study. Table 3.1 contains twelve (12) Stock Exchanges which are located across different regions of Africa. As depicted in the table, North Africa has two (2) stock exchanges, the Southern African region on the other hand has five (5) stock exchanges while the West African region has three (3) stock exchanges. The East African Region has two (2) stock exchanges from the 12 stock exchanges. Due to data availability, the present study is restricted to 12 out of the 27 existing stock markets.

Table 3.1
List of Selected African Stock Exchanges

S/N	Exchange	Country	Region	Founded	Capitalization in Billion ($)	Listed Companies
1	Bourse Regionale les Valeur Mobill	Cot Devoir	West Africa	1987	12.1213	45
2	Egyptian Stock Exchange	Egypt	North Africa	1883	19.775	251
3	Ghana Stock Exchange	Ghana	West Africa	1989	7.8311	42
4	Nairobi Securities Exchange	Kenya	East Africa	1954	23.1121	65
5	Malawi Stock Exchange	Malawi	Southern Africa	1994	5.1121	14
6	Stock Exchange of Mauritius	Mauritius	Southern Africa	1989	73.479	75
7	Casablanca Stock Exchange	Morocco	North Africa	1929	61.114	73
8	Namibia Stock Exchange	Namibia	Southern Africa	1992	6.706	10
9	Nigeria Stock Exchange	Nigeria	West Africa	1960	13.905	169
10	Johannesburg Stock Exchange	South Africa	Southern Africa	1887	321.667	294
11	Uganda Securities Exchange	Uganda	East Africa	1995	7.1121	18
12	Lusaka Stock Exchange	Zambia	Southern Africa	1994	4.691	24

Source African Securities Exchange Association, 2016.

Table 3.1 reveals that from the twelve stock exchanges, the Johannesburg Stock Exchange has the highest number of listed companies and total market capitalization. This confirms the assertion of the previous literature (Ahmed & Huo, 2018; Bundoo, 2017) that Johannesburg Stock Exchange is the most developed and sophisticated stock exchange on the African continent. Although there are currently 27 stock exchanges in Africa, some exchanges that are recently established and started floating securities are not included in the sample size. Nevertheless, the countries forming the sample size of this study are selected based on data availability, a lot needs to be done to ensure the African stock

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markets are developed to compete with emerging and developing countries markets across the globe.

There are different segments of financial system in the African region including stock markets, banking sector, insurance, and the bond markets. However, most of them (including stock markets) are nascent, not developed or even lacking in some countries (De Sousa, Beck, Van Bergeijk & Van Dijk, 2016). There is a need for concerted effort to ensure effective regulation and development of the market on the continent. Although the banking system in Africa is not developed, it is the dominant financial institution. Most of the African stock exchanges do not recover from their pre-crisis (before 2008) period in terms of market capitalization, trading volume and liquidity thus remain smallest and less developed among the global stock exchanges. The Gil-alana, Carcel and Abakah (2018) conclude that the African stock markets are still isolated from other developed global stock exchanges. Therefore, international transaction and foreign portfolio diversification can be among the critical channels for promoting interdependence of economies.

Moreover, Allen et al. (2011) assert that the financial system of Africa is dominated by traditional banking services and informal finance. Therefore, the continent's financial market is left far behind characterized by low financial literacy and less-efficient equity markets. Although there are growing effort and policy reforms to enhance equity market operation on the continent that is hard hit during the 2008 financial crisis, the markets are still battling with challenges to restore investor sentiment and attract more foreign domestic/international portfolio opportunities. Similarly, risk diversification is among

important investment strategies advocated for emerging economies. Hence, investors gain more returns when they spread their risk across nations. In a related study, Mensah and Alagidede (2017) argue that international portfolio diversification is necessary when markets are in a stable condition. It is worth mentioning that attention should be given towards formulating more market-oriented policies to expedite the recovery process.

3.3 Theoretical Framework

This section provides an important link between the dependent variable and the variables of interest of this study to justify the testable hypotheses in addition to the empirical evidence of the previous research. The theoretical framework of this study is based on the Arbitrage Pricing Theory (APT) of Ross (1976) which is the underpinning theory of this study. However, the theoretical framework is presented in the following subsections.

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3.3.1 Arbitrage Pricing Theory

The Arbitrage Pricing Theory (APT) is a multifactor asset pricing model developed by Ross (1976) and is considered to be the best alternative to the Sharpe (1964) Capital Asset Pricing Model (CAPM). Contrasting to the CAPM assumption that market portfolio plays a significant role in pricing securities return, Shanken (1982) asserts that the APT show the co-variability of asset return that systematically affects the value of most assets. Similarly, Chamberlain and Rothschild (1983) disclose based on the APT intuition that asset prices are linear functions of factor loadings such that the model allows inclusion of more than one/single generating factor contrary to the CAPM assumption. Therefore, the expected return of an asset is a function of the estimated factor loadings and variables that are linked to the estimated return (Roll & Ross, 1980).

Another essential attribute of the APT model is its emphasis on the role of arbitrage in estimating a linear relation between betas and their expected returns. Hence, before estimating how asset prices respond to risk factors, it is plausible to see the classification of risk that may have a linear relationship with the expected return. The risk associated with asset return is categorized into systematic/non-diversifiable risk and unsystematic/diversifiable risk. Thus, in pricing the expected return of an asset, more emphasis is given on the systematic risk that is not diversifiable.

Therefore, the return of any asset can be expressed as follows:

$$R = \overline{R} + U \ldots\ldots\ldots\

Here, β_{ki} is the sensitivity of investment i, to changes in the common risk factors, F_{ki} is the k risk factors that affect the investment return while the ε_{it} captures the portfolio of R_{it} that are not priced by the common risk factors.

The importance of portfolio risk diversification cannot be overstressed as Ross et al. (2012) assert that the unsystematic risk vanishes in a well-diversified portfolio. In fact, shareholders have less regard to the unsystematic risk with a belief that only the systematic risk portion of securities can be related to their expected return. Similarly, it was stated that an asset return responds to the value of factors that vary over time (Oberuc, 2011). The expected return of security, however, comprises of the risk-free rate and the compensation for each category of risk that it bears.

The empirical test of the APT estimates how the dependent variable of this study reacts to the changes in the selected independent series of the model. Thus, the existence of strong evidence confirms the rejection of null hypotheses of this study. However, the selection of variables that affects the stock market development needs both theoretical and empirical justification. It is however observed that the arbitrage pricing model and modern portfolio theories are silent on the underlying systematic risk factors that may have influence on asset returns (Chen et al., 1986; Cox, Ingersoll, & Ross, 1985; Roll & Ross, 1980). Similarly, Kazi (2008) discloses that the APT model is applicable to any set of portfolios provided their number 'n' is much larger than the number 'k' of the common factors.

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Since APT offers a systematic link between securities return and the return generating process (Bower, Bower, & Logue, 2014), financial markets are expected to have a strong relationship with their regulatory agencies to promote efficiency, sanity and improve market participation. In his theory, Stigler (1964) conjectures that the motive behind securities market regulation is to increase a portion of truth in the world and to avert/discipline fraud. Similarly, the empirical studies of Salinger (1989) and Hsieh and Miller (1990) stressed on the importance of securities regulation in order to circumvent market volatility and reduce speculative excesses that are capable of instilling fear to investors. It is therefore expected that a sound and quality regulation should improve the efficiency of the African stock market and encourage more investors to the region that is experiencing low liquidity and divestment.

In addition, banking development brings changes to the African stock market development. The existing financial development theories provide a conflicting prediction of whether stock markets and banks are substitutes or compliments. For example, the models of Boyd and Smith (1996) and Blackburn et al. (2005) conjectured that the stock markets and banks are complements while Stiglitz (1985) model show that banks and stock markets are representing alternative sources of investment. Hence, the dominance of banking sector in the African financial system, as well as the low patronage of the stock market, may go in line with the substitutability model that discloses development of banking sector may impede stock market development. In other words, the low stock market patronage may be attributed to the dominance of banking sector in most of the developing and emerging economies (Boot & Thakor, 1997).

Moreover, it is stated that the rate of poverty on the African continent is alarming where the continent has the highest population living below poverty line (Ojeaga, 2014). The existing studies (Batuo et al., 2010; Demirgüç-Kunt & Levine, 2009; Odhiambo, 2009) were on the effect of financial development on poverty reduction. On the contrary, the present study tests how poverty reduction can predict stock market. Since Beck et al. (2007) findings suggest that poverty reduction may stimulate demand for financial services, taking concerted effort at alleviating the ravage of poverty in Africa will go a long way at improving standard of living, their income generation horizon to boost investment. For this reason, this study conjectures that poverty reduction can have a positive impact on stock market development.

Furthermore, the economic forces can have influence on share prices through changes in future expected dividend/cash flow or discount rate. Hence, this study investigates how life expectancy, unemployment and export growth explain changes in stock market development of Africa. There are existing empirical studies on the link between life expectancy and economic growth where some found a positive relationship between the series (Ecevit, 2013; Hami, 2016; Jayachandran & Lleras-Muney, 2009). These studies emphasize that when people live longer, they would keep contributing to the entire economic development. Similarly, Hansen (2013) found that longevity has a positive effect on human capital development of nations.

Another important state variable is the unemployment's effect on stock market development. Unemployment is an important policy variable that could explain the

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movement of stock prices. Although there is no consensus on how unemployment predicts stock markets, Birz and Dutta (2016) suggest that employment/unemployment announcement is among the most crucial announcements affecting stock markets. The Blanchard (1981) extended IS-LM model and Boyd et al. (2005) predict that the impact of unemployment on the stock market is predisposed to a prevailing economic condition of the countries. Therefore, unemployment news can be good to investors during economic prosperity and bad in a recession period. Taking into cognizance the level of unemployment in the African region, this study predicts a positive relationship between stock market development and the level of unemployment.

Furthermore, this study selects export growth to examine its influence on the African stock market development. Despite the significance of international transactions, how export growth relates to the stock market in Africa remains an unanswered policy question. Since all nations, depend on other countries in one way or the other, the growth of export transactions between Africa and its trading partners may go a long way in reducing importation of processed goods and may strengthen the expected future cash flows of the domestic firms. The existing literature mostly focused on the impact of financial development on export performance (Beck, 2003; Minetti & Zhu, 2011; Rajan & Zingales, 2008). On the contrary, this study estimates the effect of export growth on the development of African stock market. The theoretical intuition is that, when there is growth in export of African countries, it would increase the revenue and expected future cash flows of firms in the region.

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Therefore, the modified version of the APT model based on the above postulation and in line with the study of Prasanna and Menon (2012) is expressed below:

$$R_{it} = \alpha_o + \omega_{1i}F_{1i} + \omega_{2i}F_{2i} + \omega_{3i}F_{3i} + \omega_{4i}F_{4i} + \omega_{5i}F_{5i} + \omega_{6i}F_{6i} + \varepsilon_{it} \quad (3.5)$$

Here R_{it} represents the dependent variable (stock market development), α_o is the risk-free rate/expected return, ω_{1i}, $\omega_{2i}, \omega_{3i}, \omega_{4i}, \omega_{5i}$ and ω_{6i} are the reaction coefficients of the model while F_{1i}, F_{2i}, F_{3i}, F_{2i}, F_{4i}, F_{5i} and F_{6i} denote regulatory quality, banking development, life expectancy, poverty reduction, unemployment and export growth respectively as the newly included series of the model.

In summary, the regulatory quality, poverty reduction, life expectancy, unemployment and export growth variables are expected to be positively related to the stock market development while the banking sector development effect can be negative based on the substitutability model assumption (Blackburn et al. 2005; Stiglitz 1985). Hence the prior expectation of the parameters in equation 3.5 is hypothesized as $\omega_1 > 0$, $\omega_2 < 0$, $\omega_3 > 0$, $\omega_4 > 0$, $\omega_5 > 0$ and $\omega_6 > 0$ for the regulatory quality, banking development, life expectancy, poverty reduction, unemployment and export growth respectively.

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3.4 Measurement of Variables and Expected Results

The following are the various measures to be used for both the dependent and independent variables of the study.

3.4.1 Measurement of Dependent Variable

The stock market development has different indices as used in previous studies. However, there is no theoretical justification for the supremacy among the indicators as no single measure captures all the features of stock market development. The first indicator is the market capitalization ratio which indicates the size of markets and measures the value of shares listed divide by gross domestic product (GDP). Secondly, there is turnover ratio which is the ability of market to easily transact shares on the exchange. The turnover ratio captures the value of shares traded relative to market capitalization. The third indicator is the stock traded value which as the name suggests, is the value of equities traded in the market relative to GDP. In other words, the stock traded value measures the transactions comparative to the size of an economy.

To be more specific, the capitalization is used to proxy for market size while both the stock traded and turnover ratios represent market liquidity. However, Levine and Zervos (1998) argued that using each of these indicators separately has a shortcoming and does not represent the entire development of stock market. The authors contend that a large market (capitalization) is not necessarily a liquid market because a large inactive market has large capitalization but small turnover. Similarly, a small liquid market can have a high turnover but small traded value. Since stock market development involves the interaction of several

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activities, capturing the main indicators provides a richer picture of stock market development (Levine & Zervos, 1998).

This study employs the principal component analysis (PCA) to construct a composite index. The application of the PCA is to merge different proxies into a single index for the overall stock market development. The previous literature uses a single indicator which lacks uniform argument on the most suitable to represent market development. (Aduda et al., 2012; Arize et al., 2017; Chipaumire & Ngirande, 2014; Demirgüç-Kunt et al., 2012; Law & Tan, 2009). A single proxy cannot accommodate other activities as the market is characterized to be multidimensional in nature. Therefore, capitalization indicates market size while both the stock traded and turnover ratios are indicators of market liquidity.

However, the alternative proxies measuring different aspects of stock market development reflects the multidimensional nature of the market. Abdi and Williams (2010) argue that the goal of principal component analysis as a multivariate technique is to extract important information from different dimensions to be represented using a single index. Thus, taking into consideration the multidimensional nature and the disadvantage of using a single indicator, this study follows Pradhan, Arvin and Norman (2014), Naceur et al. (2007), and Owusu and Odhiambo (2014) to construct a composite index of market development. Therefore, the composite index of stock market development is computed using the following equation:

$$SMD_{it} = \sum_{m=1}^{3} w_m indicator_{mit} \quad \ldots\ldots\ldots\

Here w_m represents weight (factor loading) derived from the PCA, the indicator_{mit} stand for indicator r for country i at time t. Thus, the r in the equation denotes the 3 subcomponents (market capitalization, stock traded value and the turnover ratio) of stock market development. Furthermore, Appendix M depicts the results of the principal component analysis where the composite index of stock market development corresponds with the first component.

3.4.2 Measurements of Independent Variables

As the name implies, the independent variables may have a negative, positive or no effect on the dependent variable. In this case, they are variables selected based on previous literature and are expected to influence stock market development in selected African countries.

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3.4.2.1 Regulatory Quality

The regulatory quality variable captures government ability to articulate and execute sound policies that can support and protect a private sector investment. Previous literature uses several measures to represent regulatory quality variable both at the firm level and country level. For example, Eita (2015) and Bello (2014) utilize data from the World Governance Indicators while Bruno and Claessens (2010) and Yartey (2010) use data from the International Country Risk Guide. Similarly, Prevoo and Weel (2010) use market abuse regulation announcement to capture regulatory quality while Akyol et al. (2014) and Prasanna and Menon (2012) adopt country-level and firm-level corporate governance data respectively. Lastly, Claessens (2006) and La Porta et al. (1998) use the shareholders' protection index.

However, the present study use annual data of the regulatory quality that was extracted from the World Governance Indicators (WGI) Database in line with the works of Bello (2014) and Eita (2015). This measure of regulatory quality is chosen because of its importance as disclose in the above literature. Therefore, the figures (scores) lie between -2.5 to 2.5 where a higher score is an indication of effective and sound regulation supporting private sector investment and vice versa. Due to the declining investors' confidence on African stock market, it is expected that an improved regulatory oversight can transform the market to a better and resilient investment environment.

Due to the nature of African stock market, there is a need for an extensive and dynamic regulatory framework to guard against illicit financial transactions and future financial crisis. It was observed that lack of regulatory independence and weak financial market supervision are among the key challenges confronting the African financial system (Laura, Carlo & Laura, 2016). Similarly, Akyol et al. (2014) disclose that transparency and accuracy of information flow are enhanced in a well-regulated market. Therefore, a weak regulation can compromise effectiveness and development of other policies affecting the entire financial market operation. This seems to suggest that a strong regulatory framework can be a confidence builder on stock market investment and development. This is because stock market is regarded as an alternative funding avenue for firms and other investors to diversify their investment portfolio.

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3.4.2.2 Banking Sector Development

Banking sector development is a process that results in an improvement of quality, quantity, and efficiency in bank services. There are contrary views on which indicator to proxy for banking sector development due to numerous activities taking place in the industry despite the past literature provides us with various measures. The first measure is bank credit which refers to total credit that deposit money banks lend to the private sector for a given period as a share of GDP. The second indicator is private credit representing credit given to the private sector by all financial intermediaries to GDP, while the third sign is bank deposit which denotes total liquid liabilities ratio to GDP. However, Kaya, Bektaş, and Feridun (2011) use ratio of total liquid liabilities to GDP while Levine and Zervos (1998) use the value of loans made by commercial banks and other deposit money banks, for a private sector as a share of GDP.

This study uses the annual data of private sector credit by banks to proxy for banking sector development. The domestic credit to the private sector is strongly suggested by many studies including Ndako (2010) and Beck (2010). The private sector credit represents the amount of external financing to private firms which is channeled through the banking sector. It captures the main function of financial institutions with regard to channeling savings to investors. Yartey (2008) asserts that private credit is the most comprehensive indicator of commercial banks' activities to the real sector. Hence, Figure 3.1 depicts the trend of annual banking development (private credit) and stock market development for the period 1996 to 2016.

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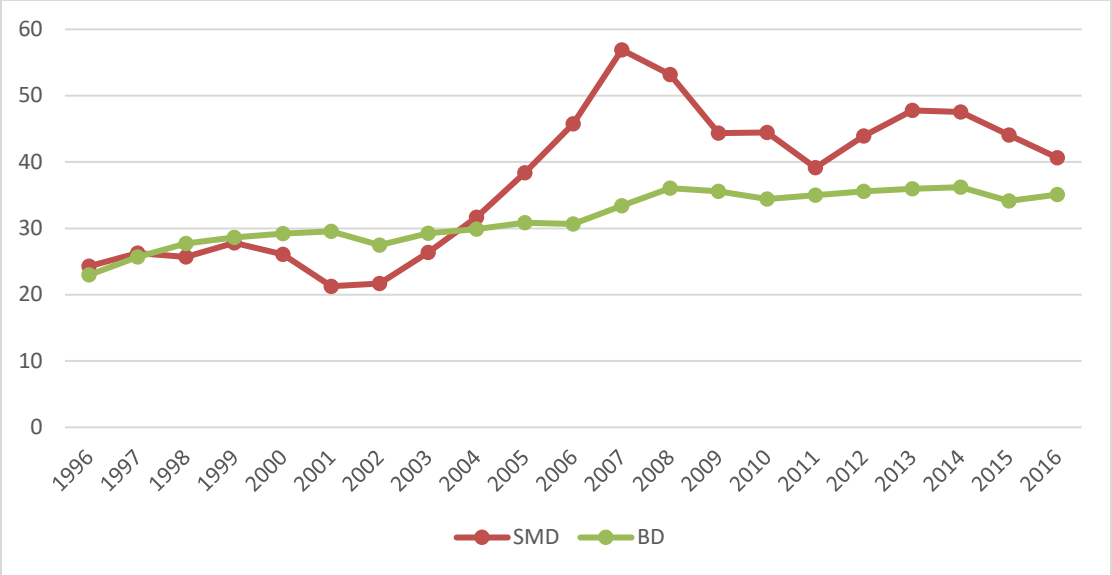

Figure 3.1
Trend of Banking Sector Development and Stock Market Development

Figure 3.1 illustrates the co-movement of banking sector development and stock market in Africa. Despite banking sector development dominates the financial system of the African continent (Mbulawa, 2015), it shows the private sector credit by banks in Africa is lower which may not help in reducing the infrastructural deficit and financing need of firms. The highest ratio of the bank credit was 32.2 in the year 2014. The ratio is expected to be higher as an indication of commitment to make funding/credit available to the private sector. In other words, the low level of credit indicates banks are reluctant to offer loan to the private sector for investment. On the other hand, the trend of stock market in the selected African countries indicates low development which may not be unconnected to uncertainty, unstable investment environment and poor funding. In fact, the low development can also be attributable to financial crisis eroding investors' confidence and level of financial integration to the global financial market. Boamah et al. (2017) disclose that the African stock exchanges are associated with market illiquidity. This is a source of worry to the

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African stock market seeking adequate investment to cater for financing needs of firms in the continent.

3.4.2.3 Life Expectancy

The life expectancy represents the overall mortality rate of a population for a given period. It is an average estimate/statistical measure that people or age group are expected to live. This is an important indicator used to represent the health status of a population. The indicator varies according to the improvement of health and other related issues affecting human life. Due to public health improvement, the average life expectancy is higher in advanced nations compared to developing and emerging economies. The life expectancy was measured differently from the previous literature. For example, Hansen (2013), Acemoglu and Johnson (2013); Ecevit (2013) used annual data for life expectancy at birth. Jayachandran and Lleras-Muney (2009) used maternal mortality[14] rate data to proxy life expectancy while Mahumud et al. (2013) use public health expenditure as an indicator for life expectancy.

This study, however, used the annual data of life expectancy at birth extracted from the World Development Indicator to represent life expectancy in line with the Hansen (2013). It was stated that life expectancy at birth has economic benefit through lower morbidity (Bloom et al., 2010). Hence, a reduced mortality rate is highly valued by households in

[14] The rate of women dying in pregnancy irrespective of the duration of prenatal period and cause of the death.

making their future investment decision. Figure 3.2 depicts the trend of life expectancy and stock market development in the selected African countries.

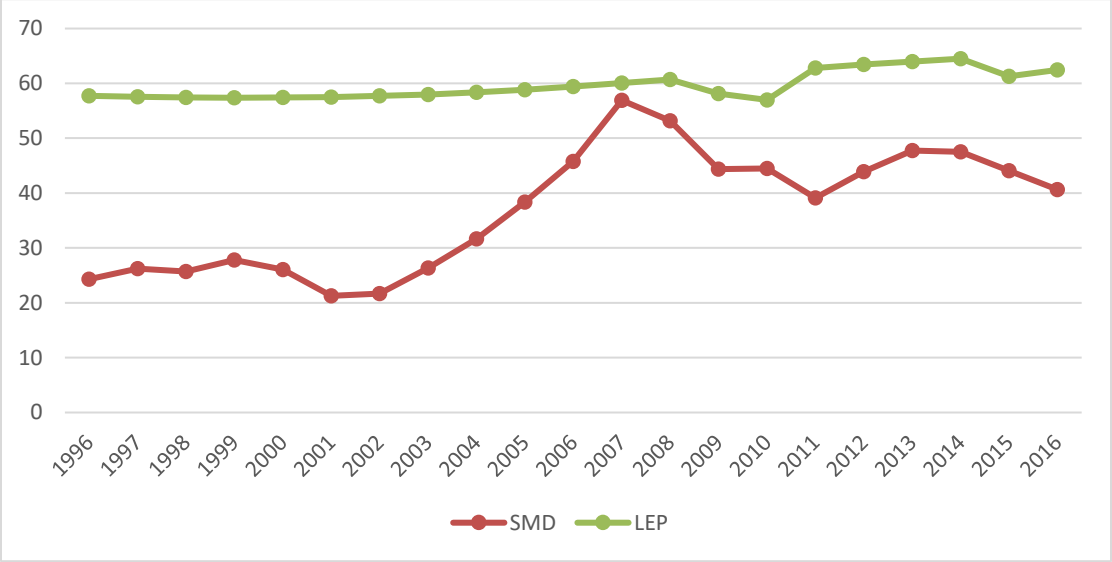

Figure 3.2
Trend of Life Expectancy and Stock Market Development

Source: World Development Indicators

The figure shows the annual movement/changes of life expectancy and stock market development where the highest life expectancy was recorded in the year 2014 which is 64 years. This is far below the available figures of life expectancy in other emerging economies based on the statistics from the World Development Indicators. Acemoglu and Johnson (2007) conclude that the health condition of less developed economies is in dire need of improvement. Hence, improvement of life expectancy is necessary for household investment in financial markets. In fact, people are better off when they are assured of longevity. Intuitively, households would be willing to forgo their current consumption for investment when there is an increased likelihood of survival. It is worth mentioning that access to medical and health facilities may have a potential of reducing death rate and

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improving health condition of investors. Bully and Pepper (2017) asserts that prioritizing of immediate return is a predictable response to high mortality rate. The health gains of longevity can be transformed to increase in savings, productivity and investment in stock markets.

3.4.1.1 Poverty Reduction

Poverty is a state of being poor or a situation that households cannot afford their necessities of life due to absolute low-income level. Poverty level is also having different type of measurement. For instance, Tsagkanos (2017) and Sun et al. (2013) studies use Gini coefficient[15] to proxy for poverty. In contrast, Naceur and Zhang (2016) and Beck et al. (2004) utilize the poverty gap index from the World Development Indicators while Dhrifi (2013) uses household final consumption expenditure as a measurement for poverty reduction.

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Based on data availability this study utilizes the annual data of household consumption expenditure for the measurement of poverty reduction in line with the works of Dhrifi (2013) and Quartey (2005). The data of other measures of poverty reduction (Gini coefficient and Poverty head count) is not stable/available for developing economies. However, the annual data of household consumption expenditure is available for all countries from the database of the World Development Indicators. It was disclosed that it is more stable and reliable to use household consumption expenditure to proxy for poverty

[15] Gini coefficient/index is a statistical measure of poverty rate where it abridges the entire income distribution of a nation between 0 and 1 numbers. A higher number represents high level of poverty/income inequality.

reduction (Sehrawat & Giri, 2016). This study employs the poverty reduction as a potential predictor of stock market development because the poverty is considered among the crucial factors affecting households, firms and economic development. Figure 3.3 shows the trend of annual household consumption expenditure and stock market development.

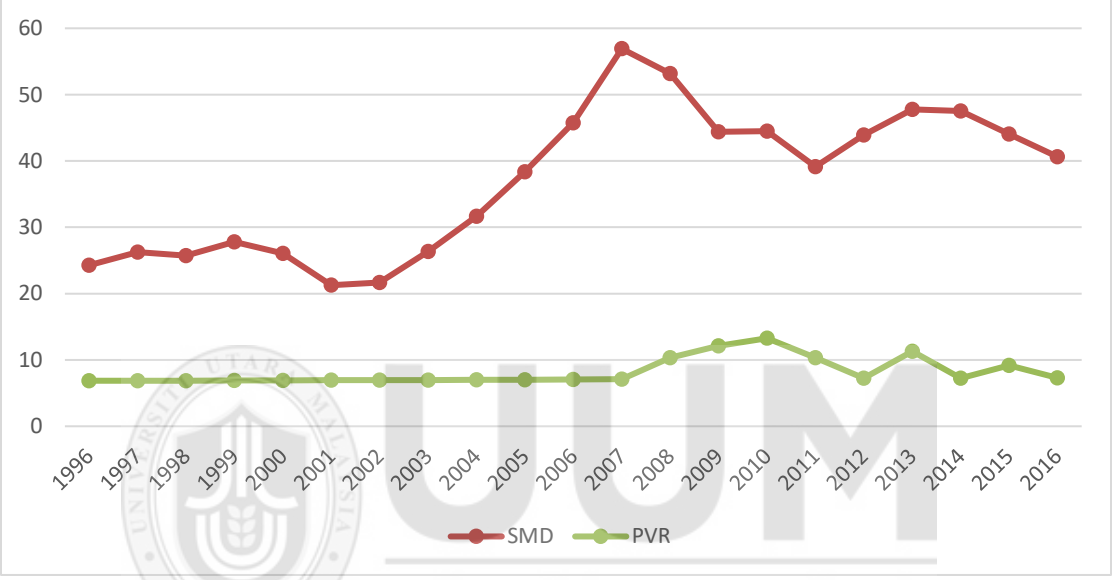

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Figure 3.3
Trend of Household Consumption Expenditure and Stock Market Development

Figure 3.3 illustrates the annual movement of poverty reduction (household consumption expenditure) and stock market development. Both variables have recorded low indices and unstable movement. Based on the figures, it is worth emphasizing that a lot need to be done in the African region to achieve the goal of poverty reduction and accelerate stock market development. Intuitively, reduction of poverty in Africa can result to more investment in stock market. The ratio of final consumption expenditure is far lower with a highest figure of 13.2 in 2010. In fact, the poverty level in the African region is so pervasive with more

than half of the population living below the poverty line which is a serious setback retarding domestic investment (Akwara et al., 2013).

In a related study, Beck et al. (2007) suggest that policies on poverty reduction may stimulate demand of financial services including stock market development. Consequently, addressing the poverty level and other associated socioeconomic factors can give the African inhabitants an opportunity to save their income for future investment in stock markets. It was observed that Africa is the only region that did not meet the millennium development goal of halving poverty by 2015 (Beggle, Christiaensen, Dabalen & Gaddis, 2016). This is a serious risk to development and prosperity of the region that needs adequate attention in the African literature.

3.4.1.2 Unemployment Rate

Unemployment variable measures the number of people that are either redundant or searching for a job. However, most of the previous studies are on the relationship between unemployment and economic growth. There is a limited number of studies that relates unemployment to the stock market development. Though there are opposite views regarding the measurement of unemployment, Ganzalo and Taamouti (2014) and Chang (2005) concentrate on the rate of unemployed to the workforce as a yardstick for measuring unemployment. The Castells-quintana and Royuela (2012) focus on the average annual rate of unemployment.

In line with the work of Amassoma and Nwosa (2013), this study adopts the annual unemployment rate as a percentage of total labor force for measuring unemployment.

Farmer (2010) disclose that a decline in investor's confidence cause nations to shift from low to high unemployment equilibrium otherwise known as self-fulfilling crisis of confidence. However, the annual trend of unemployment and stock market development is depicted in Figure 3.4:

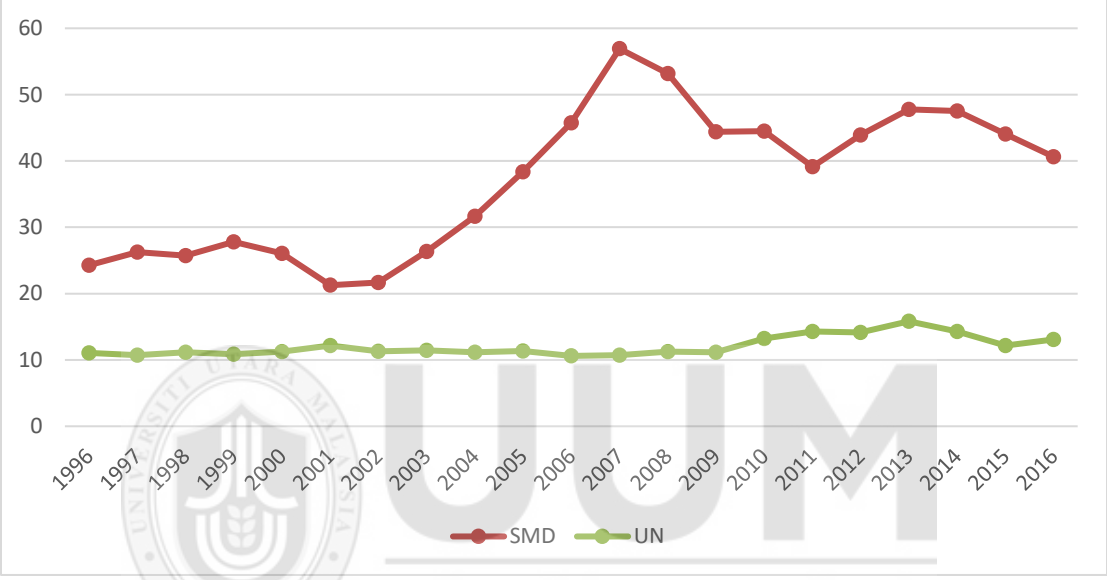

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Figure 3.4
Trend of Unemployment and Stock Market Development in Africa

Figure 3.4 shows the movement of unemployment and stock market development in the 12 Africa countries. It indicates that unemployment rate is higher than 10% throughout the study period. This is not desirable for countries targeting economic prosperity and stock market development. In other words, the high level of unemployment on the African continent can be attributed to slowdown in economic activities without attractive investment opportunities. The financial crisis of 2008 left many firms with option of downsizing workforce to remain in business. Therefore, the past values of economic forces in Africa including unemployment unveils investors' reaction to the continent investment

environment. In a related study, Hall (2017) posit that a fall in incentive for job creation slackens labour market and rises unemployment. It was also stated that tight credit constraints can result to decline in investment and hiring of workforce both can heighten joblessness (Miao, Wang & Lifang, 2016).

Similarly, the figure reveals low development of stock market in Africa which can also be associated with a higher risk of investment. Investors are monitoring market performance and any sudden change in their perception can be reflected though panic trading. In fact, investors hardly make reliable prediction of market returns when the economic forces are unstable.

3.4.1.3 Export Growth

The term export can be used to represent goods domestically produced for foreign demand. Exports are among the most important factors indicating relationship between countries through their goods and services. There are different policies to promote nation export growth and economic growth. In fact, emphasis is given to exports due to its numerous benefits that include increase in job opportunities, rising of living standard for residents as well as its competitive advantage. The previous literature used different measures to proxy for export including firm-level export (Albornoz, Fanelli, & Hallak 2016) real export (Lorde, 2011; Seraphin & Yinguo, 2015) and monthly export growth data (Hasanujzaman, 2016).

However, this study used annual data of export growth retrieved from the World Development Indicators. The expansion of the African export horizon with more

processed/manufactured goods remain critical for firms' growth and sustainable development. This study used the export growth variable as a potential predictor of stock market development as Ouedraogo and Sourouema (2018) affirm that there is a low share of manufacturing export from Sub-Saharan Africa as most of the countries are undiversified and are dependent on single commodity export. Figure 3.5 represents the trend of export growth and stock market development.

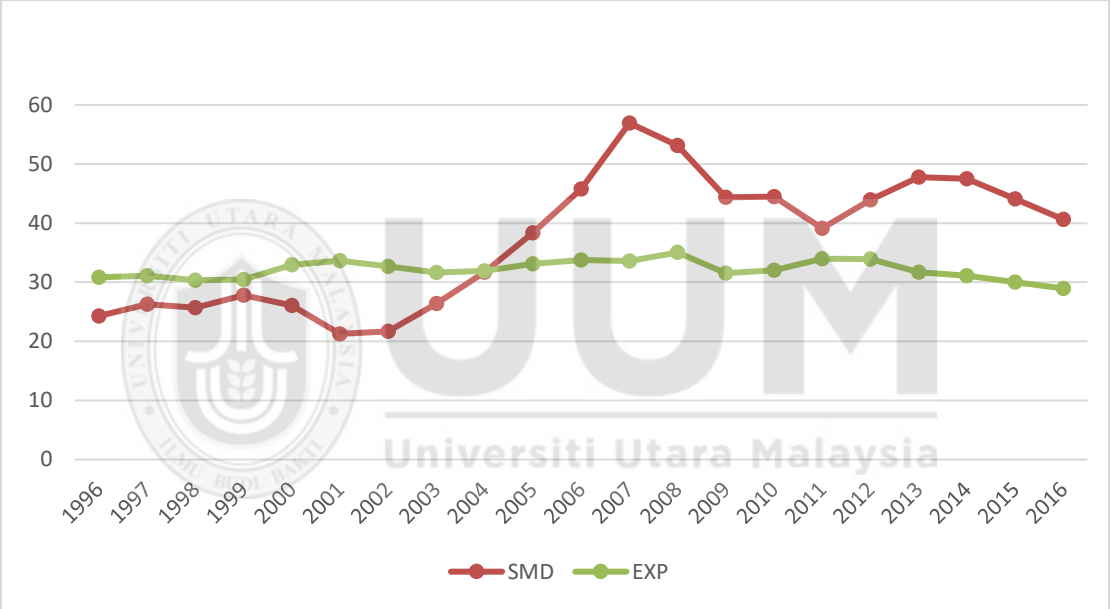

Figure 3.5
Trend of Export Growth and Stock Market Development

The annual growth of export is necessary for firms that are committed for expansion, to boost their liquidity, profitability and equity price. However, the indices of export growth in Africa as depicted in Figure 3.5 are more of primary commodities. The highest value was 35.03 in 2008 after which the level of export keeps fluctuating and declining. This may not be unconnected to the aftermath of the 2008 global financial crisis that resulted to

wealth and confidence erosion in developing economies. In fact, it was observed that, the financial crisis resulted in a substantial decline of foreign investment inflow to the African region which has exacerbates a huge loss of market capitalization (Boamah et al., 2017).

3.4.1.4 Exchange Rates

The importance of exchange rates, especially with regards to stock market development cannot be overstressed. It is a rate at which domestic money can be exchanged for foreign currency. There are two important indicators to proxy for exchange rates. There is real exchange rate (RER) which denotes rate of a country's currency to foreign exchange (adjusted for inflation) and a nominal exchange rate which is not deflated and used as a flexible or fixed rate. Numerous studies have used the nominal exchange rates including but not restricted to Abdalla and Murinde (1997), Adjasi et al. (2011), Alhayky and Houdou (2009), Hussein and Mgammal (2012) and Aliyu (2009). However, some literature including Chen and Chen (2012) and Hajilee and Al Nasser (2014) use real exchange rate.

In line with the works of Aliyu (2009), this study uses annual data of nominal exchange rate from the World Development Indicators Database as a proxy for exchange rates and to examine how it predicts stock market development in Africa. The use of nominal exchange rates is necessary because an increase in demand for local currency can force interest rates to rise which will ultimately attract foreign investors seeking for maximum benefit (Suriani et al., 2015). Figure 3.6 describes the annual movement of exchange rate and stock market development in the 12 African countries.

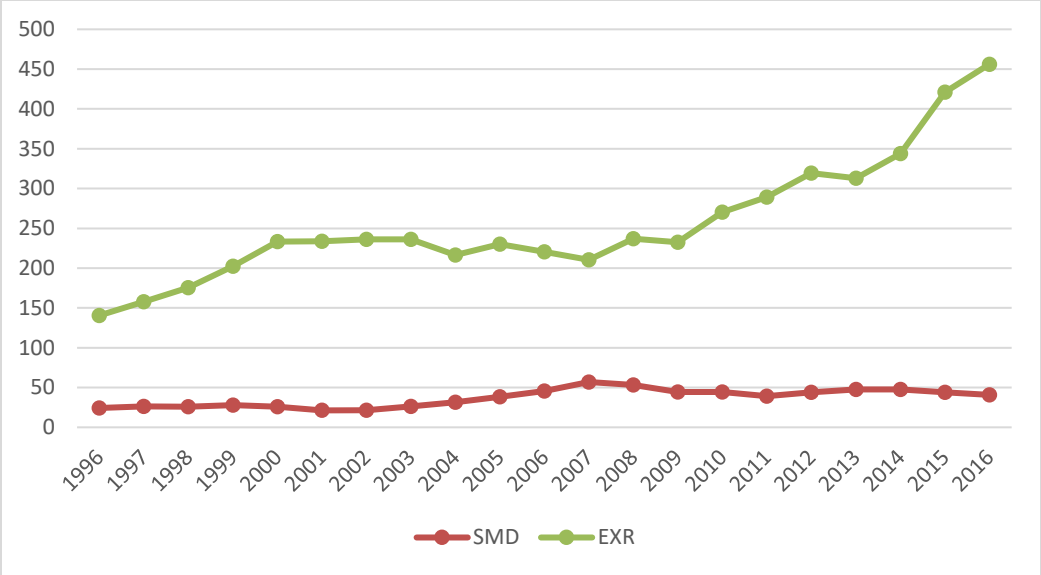

Figure 3.6
Trend of Exchange Rate and Stock Market Development

Figure 3.6 represents annual movement of exchange rate and stock market development where the rate of exchange rate continues to rise to 456 points as of 2016. This is a source of worry for potential investors and it is an indication of instability of economic forces in the African region. In other words, investors can interpret the high volatility of currency as a reflection of poor economic performance (negative signal) which may result to depressing price of shares and panic trading. The figure also describes trend of stock market development which is also signaling low market development indices. A rise in stock market indices entails improvement of market development and a necessary condition for potential investment. Cheng and Chiang (2016) assert that stability of economic forces is significant in predicting market returns. Similarly, Zafar (2013) disclose that expansion of economic activities and stability of exchange rates have impact on stock markets. However, an abnormal rise of exchange rate is not desirable for both importing and exporting firms.

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Therefore, currency stability is necessary for stock market to connect real sector and international investors. Dimitriva (2005) opines that foreign investors are unwilling to hold assets in a depreciated currency which erodes their return on investment. Countries that are developed have stable exchange rate and conducive environment for investment. In view of this, African investors should be mindful of exchange rates movement when formulating their hedging and portfolio diversification strategies.

3.4.1.5 Interest Rates

The importance of interest rates on stock market development cannot be overemphasized. It is a fee charged for money borrowed or lent. It also denotes rate paid for using money for a particular period. There are a good number of researches works on interest rate and stock market using a different measurement. For example, Eita (2014) and Laopodis (2012) adopt the treasury bills rate[16] for measuring interest rates while Assefa and Mollick (2014) in their study use discount rate[17] to proxy for interest rates. The nominal deposit rate was employed by Alam and Uddin (2009) as a proxy for interest rates. There are also long-term and short-term components of measuring interest rates used in literature. Amarasinghe (2015) and Kganyago and Gumbo (2015) adopt short-term interest rates while Moya-Martínez et al (2015) and Volpert (2013) use long-term interest rate as a standard for interest rates measurement.

[16] A rate for short term debt obligation backed by central banks with a less than one-year maturity period.
[17] An interest rate charged to commercial banks and other financial institutions for borrowing from their central banks.

This study used annual data for lending rate extracted from the World Development Indicators database. The wisdom behind adoption of lending rate is that, from literature, higher rates will discourage investors to approach credit market and seek for loans for long term investment. On the other hand, when lending rate is low, it encourages borrowing and can have impact on the real sector through increase in economic activities. Figure 3.7 describes the annual movement of lending interest rate and stock market development.

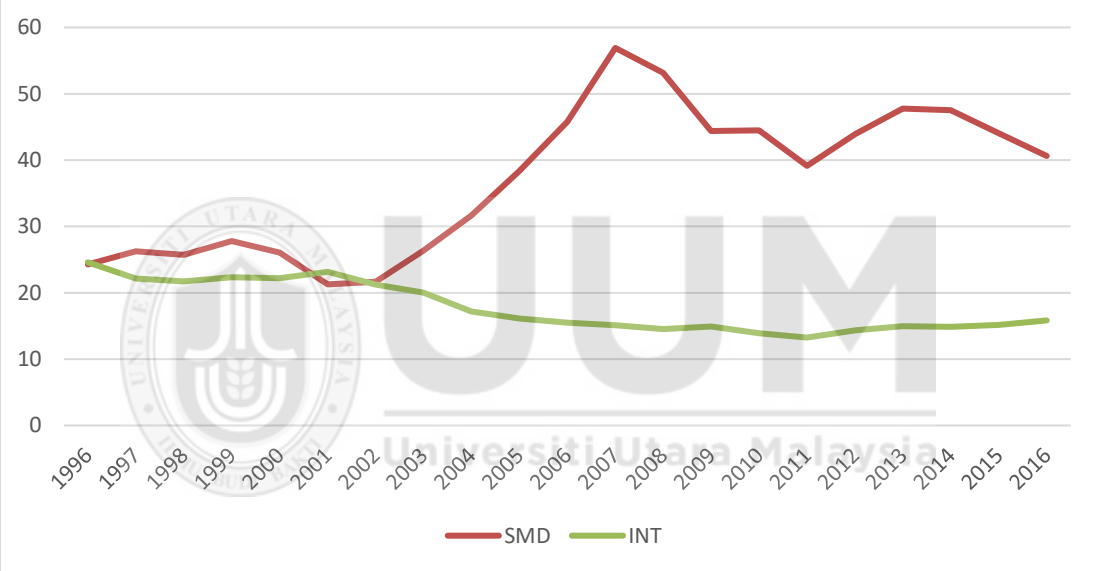

Figure 3.7
Trend of Interest Rate and Stock Market Development

The interest rate charged on lending in Africa is relatively high which can discourage investment and expansion of economic activities. The rate was up to 23% in 2001 and 15.9% as at 2016 which needs monetary policy intervention to induce borrowing and long-term investment in stock market. In fact, the interest rate spread reflects high cost of borrowing. Needless to say, it is difficult for low income earners and/or potential investors to access credit facilities when the rate is excessively high. Dahou et al. (2009) reveal that

a rise in interest rates reflects high cost of credit in Africa. The predictive power of economic forces including interest rates on stock market can help investors make informed decision on their portfolio diversification. Similarly, Kulathunga (2015) observes that economic forces affect discount rate which is the ability of firms to generate cashflow and make future dividend payment.

On the other hand, the low indices of stock market in the graph is an indication that the African stock market is not attractive to both domestic and foreign investment. To put it differently, participants of financial market pay attention to underlying economic forces that affect their confidence and future investment. Thus, the African countries are in dire need of expansionary monetary policy intervention (Lower interest rates) to encourage investment and enhance the declining investor's confidence on the continent's stock market.

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3.4.1.6 Global Financial Crisis

The global financial crisis (GFC) is the period of extreme pressure and stress in the world financial markets and institutions. This study considers the 2008 crisis to determine its impact on the African stock markets. The GFC of 2008 had its origin from the United States due to the loss of investors' confidence in the Sub-prime mortgages leading to liquidity crisis which spread to many markets with a varying degree of contagion. Another important factor that triggers the crisis was the insufficient regulation of the financial markets and institutions which resulted in excessive borrowing and default in payment. This study follows the previous literature (Ali & Afzal, 2012; Bonga-bonga & Hoveni, 2013) that used

dummy variables for the pre and crisis period where 0 is for a period before the GFC and 1 representing crisis period.

3.4.2 Expected Results

This section shows the expected outcome on the relationship between the explanatory variables and stock market development. Specifically, the regulatory quality, life expectancy, poverty reduction, unemployment, export growth and exchange rates are expected to be positively related with the dependent variable while banking development, interest rates and structural break are expected to be negatively related with the stock market development. Table 3.2 gives the variables of the study with their measurement, sources and the expected outcomes.

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Table 3.2
Summary of the Variables Definition

Variables	Measurement	Sources	Expected Outcome
SMD= Stock Market Development	Composite index	Financial Development and Structure Database	N.A
RQ= Regulatory Quality	Sound policies and regulations	Worldwide Governance Indicators	(+)
BD= Banking Development	Private sector credit relative to GDP	WDl-World Bank database	(-)
LEP= Life Expectancy	Life expectancy at birth	WDl-World Bank database	(+)
PVR= Poverty Reduction	Household final consumption expenditure per capita	WDl-World Bank database	(+)
UN= Unemployment	Unemployment, total (% of total labor force)	WDI-World Bank database	(+)
Export Growth	Export of goods and services (annual % growth)	WDI-World Bank database	(+)
Exchange Rates	Official exchange rates	WDI-World Bank database	(+)
Interest Rates	Lending interest rates	WDI database	(-)
Global financial Crisis (GFC 2008)	Dummy variables as one represents the crisis period and zero otherwise	WDI-World Bank database	(-)

3.4.3 Research Framework and Hypothesis Development

Based on the underpinning Arbitrage Pricing Theory as well as the previous studies reviewed, a research framework is developed for the study. The framework as depicted in

Figure 3.8 comprises the dependent variable of stock market development, the independent variables of regulatory quality, banking development, life expectancy, poverty reduction, unemployment and the export growth, as well as the control variables of exchange rates, interest rates and financial crisis.

There are models developed previously on how the stock market development relates with other variables as shown under the literature review section of this research (Aduda et al., 2012; Akpan & Chukwudum, 2014; Ayaydin & Baltaci, 2013; Ebele, 2016; Hajilee & Al Nasser, 2014; Khrawish et al 2010; Khyareh, and Oskou, 2015; Lin et al., 2016; Naghavi & Lau, 2016; Owusu & Odhiambo, 2014; Suriani et al 2015; Yartey, 2010).

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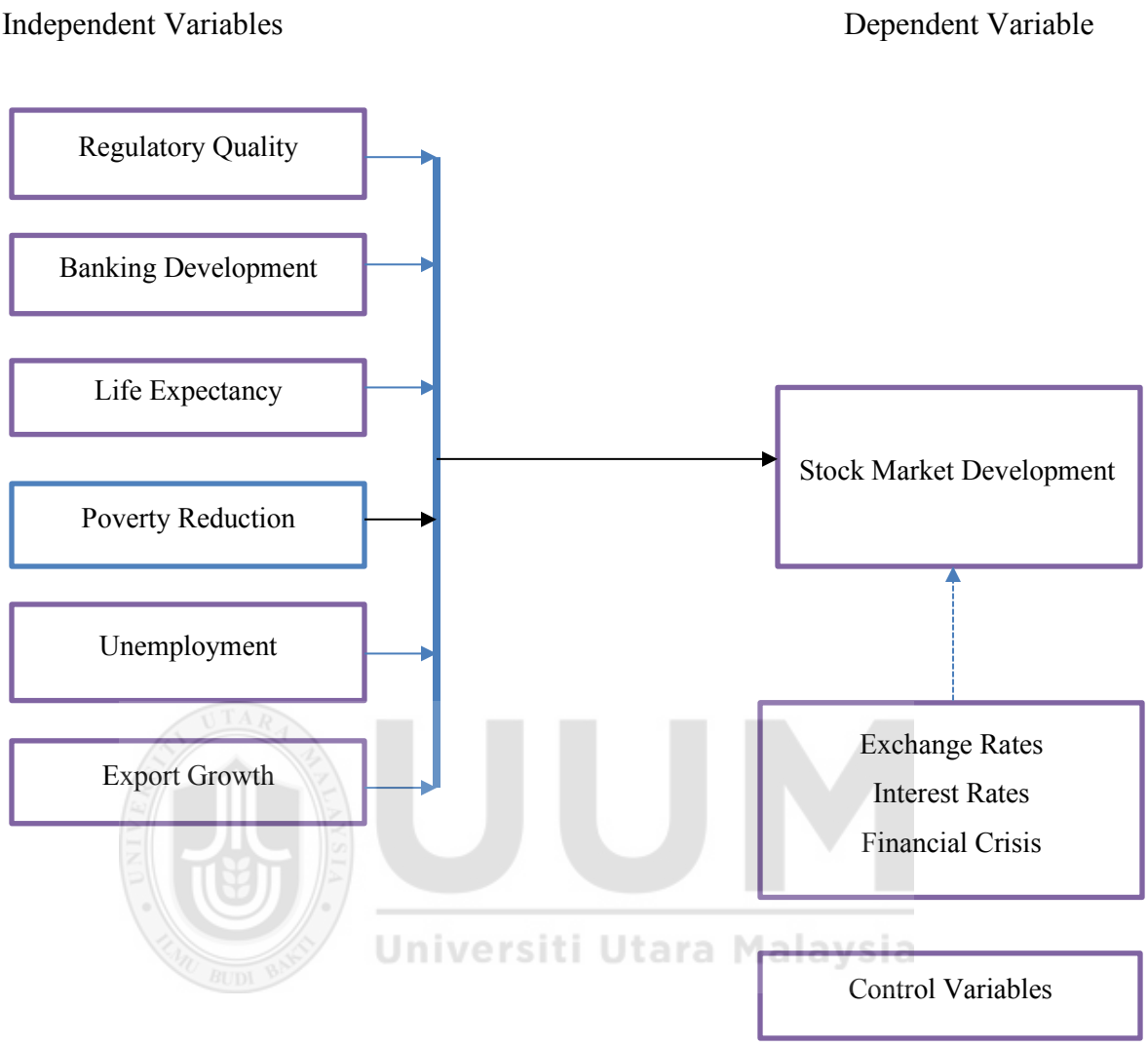

Figure 3.8
Research Framework

The hypotheses are formulated to investigate whether the selected independent variables of this study have a strong relationship with stock market development. The underpinning theory (Arbitrage Pricing Theory) as well as the existing empirical literature are used to guide this study in formulating the six hypotheses. The Arbitrage Pricing Theory (APT) was developed by Ross (1976) due to the limitation of the Capital Asset Pricing Model

(CAPM). The APT is a multiple-risk-factor model that permits researchers to include several variables to predict stock market returns.

3.4.3.1 Regulatory Quality and Stock Market Development

The regulation of financial markets become a critical issue affecting their operation to guard against illicit and fraudulent activities capable of eroding investors' confidence. There are few studies conducted on the effect of regulation on securities market such as Cattaneo et al. (2015) and Akyol et al. (2014). However, the study of Yildiz et al. (2017) examines the reaction of the Bursa Istanbul to the stock groupings and found a strong response due to the enforcement of the new regulation. Similarly, Eng et al. (2013) and Bagnoli et al. (2008) investigate the response of the U.S stock market to fair disclosure (FD) regulation announcement and their findings reveal increase in market returns. On the contrary, Ramiah et al. (2015) found that environmental regulation leads to a negative abnormal return and increase the systematic risks for polluting firms in the United States. A similar negative abnormal return was reported (Jain et al., 2010) due to the option backdating regulation announcement in the United States.

Based on the existing empirical evidence on the securities regulation-stock market nexus, this study assumes that strong and effective regulation can improve the performance of the African financial markets. In other words, a positive and statistically significant relationship is expected between the regulatory quality and stock market development. Following the Arbitrage Pricing Theory and empirical studies of Eng et al. (2013) and Bagnoli et al. (2008), this study formulates the following hypothesis:

H1: *Regulatory quality significantly impacts SMD in the selected African countries.*

3.4.3.2 Banking Sector Development and Stock Market Development

The empirical literature on the relationship between banking development and stock market development is very limited in developing countries. Though, it has been established that a well-developed financial system was due to the complementarity of banks and stock market in offering financial services (Blackburn et al., 2005). There are existing studies supporting the positive relationship between the variables. For example, Almutai (2015) confirms a long-run positive relationship between the banks and stock markets in Saudi Arabia. Demirguc-kunt and Levine (1996) report similar findings with emphasis that stock markets and banks are complementary vehicles for financing corporate investment.

On the contrary, Ho (2017) and Cheng (2012) found a negative nexus between the stock markets and banking development in Malaysia and Taiwan respectively. The inverse relationship can be that the development of one can lead to slow development of the other. Their findings further reveal the dominance of the banking sector in most of the developing countries with a little contribution of stock markets to the financial system development. In line with the Arbitrage Pricing Theory, this study formulates the following hypothesis:

H1: *Financial development significantly affects SMD in the selected African countries*.

3.4.3.3 Life Expectancy and Stock Market Development

Despite limited evidence on the relationship between life expectancy and stock market development, there are studies that suggest a positive nexus between life expectancy and economic growth (Ecevit, 2013; Goyal, 2004). Their findings conclude that additional living years would translate to human capital investment leading to sustainable economic

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growth. They further argue that access to quality health services and improved standard of living are among the key contributing factors causing longevity. Therefore, a demographic change plays a significant role in how household invests their income to accumulate future earnings.

In contrast, Acemoglu and Johnson (2007) and Kunze (2014) found a negative relationship between the variables in support of the standard neo-classical Solow model that an increased population impedes economic growth due to decline of land to labor ratio. In line with the findings of Ecevit (2013) and Goyal (2014) that report positive life expectancy-growth nexus, this study predicts that a rise life expectancy can positively impact on the stock market development hence the hypothesized relationship, in line with the Arbitrage Pricing Theory is as follows:

H1: *Life expectancy significantly affects SMD in the selected African countries*.

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3.4.3.4 Poverty Reduction and Stock Market Development

There are limited empirical studies on the relationship between poverty reduction and stock market development. The emphases of the extant literature (Boukhatem, 2016; Demirgüç-Kunt & Levine, 2009; Imai et al., 2017) were on the impact of financial development on poverty reduction. Their findings reveal a positive relationship indicating that financial development benefits the poor by increasing access to various sources of financing to cater for family and business needs. In a related study, Sun et al. (2013) assert that a tight financial constraint limits the household's supports to their children human capital

investment. Similarly, Beck et al. (2004) disclose that countries with a well-developed financial intermediaries experience a speedy reduction of poverty.

However, other studies (Adams & Klobodu, 2016; Naceur & Zhang, 2016) found a negative relationship indicating that the financial development offers more benefit to the rich and well-connected individuals than to the poor. Their argument further indicates that a poor household without collateral has limited access to loans thus aggravating the poverty level. Contrary to the previous studies, this study investigates how poverty reduction contributes to the development of stock market. Intuitively, implementing policies that speed up poverty alleviation programs can increase household spendable income to meet their necessities and further make a long-term investment in stock markets. Based on the Arbitrage Pricing Theory, the hypothesized relationship is as follows:

H1: *Poverty reduction significantly affects SMD in the selected African countries*.

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3.4.3.5 Unemployment and Stock Market Development

Further review uncovers the existence of literature gap on the link between unemployment and stock market development. The available literature is mostly carried out in advanced countries. For example, Ganzalo and Taamouti (2014) examine the impact of unanticipated unemployment announcement on the United States (U S) stock prices and found they are positively related. Similarly, Farmer (2010) and Holmes and Maghrebi (2016) found the stock market and the US unemployment are causally related while Feldmann (2011) use evidence from 11 industrial countries and report that active stock markets lower unemployment rates. On the other hand, Mustafa et al. (2015) found the Malaysian Islamic stock price reacts positively to unemployment and conclude that the positive relationship

may not be unconnected to the positive correlation between equity risk premium and the unemployment.

Conversely, Jareño and Negrut (2016) found a negative link between the U.S stock prices and unemployment. Their argument of the inverse relationship was attributed to investors panic trading due to the uncertainty of future outcome. On the contrary, Farsio and Fazel (2013) and Tapa et al. (2016) report that unemployment does not cause stock price movement indicating non-response of stock prices to the announcement. In line with the findings of Boyd et al. (2005) that the nature of stock market reaction to unemployment depends on the state of the economy, this study expects a positive relationship between the variables. To put it differently, the unemployment causes a fall in the stock price as monetary authorities respond quickly by reducing interest rates which further encourage borrowing to fund long-term investment. Building on the Arbitrage Pricing Theory, the hypothesized relationship is given as follows:

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H1: *Unemployment significantly affects the SMD in the selected African countries.*

3.4.3.6 Export Growth and Stock Market Development

There is scant empirical literature on the relationship between export growth and stock market development. The emphases of the existing literature were in line with the export-led-growth hypothesis. For example, Emeka et al. (2012) found a positive link between export and Nigerian economic growth. Similar findings were reported by Yee (2016) and Seraphin and Yinguo (2015) studies indicating that an increase in export can lead to an economic expansion through diversification, employment generation and growth of domestic firms. Contrary to the above findings, Lorde (2011) reports a negative link

between the export and Mexican economic growth opposing the export-led-growth models. The inverse relationship was attributed to the high import content and the weakening local content for exports.

Moreover, other empirical studies (Hausmann et al., 2007; Jareño & Negrut, 2016) reveal it is the export sophistication that matters most for rapid economic growth. Therefore, an improvement of the export mechanism via innovation and application of modern technology play a major contribution to a rise in productivity and export, leading to faster growth. In spite of the export-led growth evidence in the previous literature, Ngoc et al. (2003) found no firm econometric evidence of export contribution to economic growth. The non-significant impact is attributed to the Vietnam inability to flourish in adopting the export-oriented policies. Although there are no much existing studies on how an export growth relates to stock market development, in line with the Arbitrage Pricing Theory, this study assumes a positive nexus between the variables and hypothesized the relationship as follows:

H1: *Export growth significantly affects SMD in the selected African countries*.

3.5 Model Specification and Econometric Approach

The study specifies Equation 3.7 as the initial model for this study. It incorporates the dependent variable as stock market development and the variables of interest which are regulatory quality, banking development, life expectancy, poverty reduction, unemployment and the export growth. The model specification of the present study follows the works of Ebele (2016), Lin et al. (2016), Naghavi and Lau (2016) and Yartey (2010)

with modifications. The model also includes the control variables of exchange rate, interest rate, and a structural break due to the global financial crisis of 2008.

$$SMD_{it} = \beta_0 + \beta_1 RQ_{it} + \beta_2 BD_{it} + \beta_3 LEP_{it} + \beta_4 PVR_{it} + \beta_5 UN_{it} + \beta_6 EXG_{it} + \beta_7 ER_{it} + \beta_8 IR_{it} + \alpha_9 BRK_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.7)$$

Where SMD represents stock market development, RQ stands for regulatory quality, PVR symbolizes poverty reduction; UN denotes unemployment LEP represents life expectancy, BD represents banking sector development, EXG stands for export growth, ER refers to exchange rates, IR symbolizes interest rates while the BRK stands for a structural break. The epsilon ε means error term, whereas i represent country and t denotes period. Equation 3.7 is extended to control for the effect of lending interest rate, exchange rate and structural break. However, i= 1, 2, 3….12 for the selected African countries while t= 1, 2, 3.....21 is for the number of years covered.

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To estimate the long-run relationship between the explanatory variables and stock market development in the selected African countries, this study applied the panel unit root and co-integration that are among precondition for estimating the PMG model.

3.5.1 Panel unit root tests

This study confirmed the integration order of the variables before proceeding to the co-integration technique. Specifically, the Im, Pesaran, and Shin (IPS) (2003) unit root was applied to determine stationarity of series which allows each of the individual panels to

have their own autoregressive parameter. Therefore, the basic equation of the IPS panel unit root is given below:

$$\Delta y_{it=\alpha_i+\rho i y_{it-1}+\sum_{j=1}^{p} \theta ij\, y_{it-1}+\varepsilon i,ti} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.8)$$

Where yit represents each variable in the model, α_i is the individual fixed effect, the ρ is selected to make the residuals uncorrelated overtime and the null hypothesis is that ρi =0.

The IPS statistics is based on averaging the Augmented Dickey Fuller (ADF) statistics which is calculated using the following equation:

$$\bar{t} = 1N \sum_{j=1}^{N} ti \ldots\ldots\ldots\ldots\ldots\ldots\ldots\

does not fit for a small sample such as this study. Blundell and Bond (1998) note that the GMM estimation technique gives a biased result when it is used to analyze small sample data. Therefore, the unrestricted PMG model specification is depicted in equation 3.10 below.

$$y_{it} = \sum_{n=1}^{r} \theta_{ij} y_{i,j-e} + \sum_{n=1}^{s} \gamma'_{ij} \mathrm{C}_{i,g-1} + \delta_i + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.10)$$

Where $\mathrm{y_{it}}$ is the dependent variable representing stock market development, $\mathrm{C_{i,g-1}}$ is the vector of explanatory variables (regulatory quality, banking sector development, life expectancy, poverty reduction, unemployment, export growth, exchange rates, interest rates and a structural break) for country i. The subscript, t = 1, 2, 3 …. for time and i = 1, 2, 3 … N, for countries in the sample. The symbol δi denotes fixed effect parameterization. The above equation can be rewritten as VECM model as shown below:

$$\Delta y_{it} = \gamma i\left(y_{it=} Y_{i,t-1} - \partial'_i \mathrm{C}_{i,g-e} + \delta_i + \varepsilon_{it}\right) + \sum_{n=1}^{r-1} \theta_{ij} \Delta \rho_{i,g-e} + \sum_{n=1}^{s-1} \gamma'_{ij} \Delta \mathrm{C}_{i,g-e} + \varepsilon_{it} \quad (3.11)$$

Where γi is the error correction term coefficient and ∂i represents long-run parameters, which are assumed to be common across entities.

Therefore, the dynamic panel ARDL (2, 1, 1, 1, 1, 1, 1) specification is presented in equation 3.12 as follows:

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$$SMD_{it} = \beta_{1i}RQ_{it} + \beta_{2i}RQ_{it-1} + \beta_{3i}BD_{it} + \beta_{4i}BD_{it-1} + \beta_{5i}LEP_{it} + \beta_{6i}LEP_{it-1} + \beta_{7i}PVR_{it} + \beta_{8i}PVR_{it-1} + \beta_{91}UN_{it} + \beta_{10i}UN_{it-1} + \beta_{11i}EXG_{it} + \beta_{12i}EXG_{it-1} + \beta_{13i}ER_{it} + \beta_{14i}ER_{it-1} + \beta_{15i}IR_{it} + \beta_{16i}IR_{it-1} + \beta_{17i}BRK_{it} + \beta_{18i}BRK_{it-1} + \gamma SMD_{it-1\mu i} + \varepsilon_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3.12)$$

However the error correction re-parameterization of the long run model is presented in equation 3.13 below:

$$\Delta SMD_{it} = \gamma_i\big(SMD_{i,t-1} - \varphi_{0i} - \varphi_{1t}RQ_{i,t-1} + \varphi_{2t}BD_{i,t-1}\varphi_{3t}LEP_{i,t-1} + \varphi_{4t}PVR_{i,t-1} + \varphi_{5t}UN_{i,t-1} + \varphi_{6t}EXG_{i,t-1} + \varphi_{7t}ER_{i,t-1} + \varphi_{8t}IR_{i,t-1} + \varphi_{9t}BRK_{i,t-1}\big) + \alpha_{1i}\Delta RQ_{it} + \alpha_{2i}\Delta BD_{it} + \alpha_{3i}\Delta LEP_{it} + \alpha_{4i}\Delta PVR_{it} + \alpha_{5i}UN_{it} + \alpha_{6i}\Delta EXG_{it} + \alpha_{7i}ER_{it} + \alpha_{8i}IR_{it} + \alpha_{9i}\Delta BRK_{it} + \varepsilon_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3.13)$$

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Here $\gamma_i = (1-\gamma_i)$, $\varphi_{0i} = \frac{\mu_i}{1-\gamma_i}, \varphi_{1i} = \frac{\beta_{1i}+\beta_{2i}}{1-\gamma_i}, \varphi_{2i} = \frac{\beta_{3i}+\beta_{4i}}{1-\gamma_i}, \varphi_{3i} = \frac{\beta_{5i}+\beta_{6i}}{1-\gamma_i}$, $\varphi_{4i} = \frac{\beta_{7i}+\beta_{8i}}{1-\gamma_i}$, $\varphi_{5i} = \frac{\beta_{9i}+\beta_{10i}}{1-\gamma_i}$, $\varphi_{6i} = \frac{\beta_{11i}+\beta_{12i}}{1-\gamma_i}$, $\varphi_{7i} = \frac{\beta_{13i}+\beta_{14i}}{1-\gamma_i}, \varphi_{8i} = \frac{\beta_{15i}+\beta_{16i}}{1-\gamma_i}$, $\varphi_{9i} = \frac{\beta_{17i}+\beta_{18i}}{1-\gamma_i}$.

The primary interest is the speed of adjustment, γi and the coefficient of the long-run estimates, $\varphi_{1i} \dots\dots \varphi_{9i}$. The inclusion of φ_{0i} in the model indicates that a non-zero mean of a long-term relationship is allowed. The model is estimated using a maximum likelihood estimation to compute the average long-run estimates and the group-specific short run coefficients. Therefore, the coefficient of γi is expected to be negative if the model exhibits a usual return to long-run equilibrium. Accordingly, the estimates of the PMG parameters

are consistent and asymptotically normally distributed for both stationary and non-stationary regressors (Pesaran et al., 1999).

However, to confirm the PMG estimate reliability, the nexus between stock market development and the predictor variables will also be examined using a linear static panel model technique. Therefore, this discussion will demand a pooled ordinary least square known as pooled OLS, random effect and fixed effect. This study starts with the traditional/static model to examine how the stock market development in Africa is predicted by the regressors of the model. The focus is mainly on the three basic static models that are pooled ordinary least square (POLS), fixed effect (FE) model and random effect (RE) models. However, each of the models has its peculiar classical assumptions to be fulfilled in order to avoid making and reporting spurious estimates.

As the name suggests, the POLS model is estimated where data of different countries are pooled together with no room for individual heterogeneity that might result in a different parameter estimate. This model uses a single regression estimate for all the individual countries over a time period. One of the central assumptions of estimating POLS is that the regressors take into account the characteristics of countries selected while controlling for the unobserved specific effects. It is also worth noting that all the series in the sample have constant intercept and the slope of coefficient over time. However, the individual characteristics can lead to heterogeneity bias because the dependent variables may not be similar across countries over time.

Cheng (2003) states that countries heterogeneity with respect to one another makes it necessary to observe their individual changes to avoid estimating or reporting spurious results. The pooled OLS model presumes that the regressors can capture the characteristic of each entity in the sample despite dropping observed specific effects (Baltagi, 2008). Therefore, the pooled OLS has the advantage of treating all variables with a constant intercept in the sample while the slope of coefficient varies with time. Cheng (2003) postulates that disregarding a particular effect leads to heterogeneity bias in the model.

In addition, the fixed effect (FE) model captures a specific effect of the cross-section in panel data to assess the impact of series for the sample period (Frees, 2004). The FE model is estimated by a least square dummy variable (LSDV) regression and the within effect estimation method that allows the individual effect (time-invariant) to be correlated with other regressors. Baltagi (2005) affirms that the FE model is suitable for a study that focuses on a specific set of N firms/countries and the inference is confined to the behavior of the set of cross sections. Similarly, Lin and Cheng, (2008) state the appropriateness of an FE model in a situation that a researcher wants to assess the difference between specific individuals making the sample of the study. It is therefore stressed that the model can fit studies that have an interest not on the entire population but on a precise set of countries.

Moreover, Bryman and Bell (2005) state that the least square dummy variable does not suffer from heterogeneity bias since the model estimates only the within effect. Therefore, drawing inferences about the observed cross-section is one of the major conditions for estimating a fixed effect model. A fixed effect model will be used alternatively to justify a

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possible specific effect in panel data set. According to Frees (2004), the FE model will allow for a time-invariant characteristic to be correlated with the independent variable. Moreover, Torres-Reyna (2007) contends that in a fixed effect model, each entity is measured separate without any correlation between error terms and constant of the model. Conversely, for the random effect model, the individual specific effects do not correlate with predictor variable whereas for a fixed effect model, different specific effects are associated with the predictor variables; therefore, the model is not hypothetically determined.

Unlike the fixed effect, the random effect (RE) model assumes individual effects (heterogeneity) are correlated with the regressors. Therefore, the intercepts and slope of variables across individuals are assumed to be similar while the difference among the individuals or time period depends on their specific error rather than on estimates. Baltagi (2005) posits that the individual effect is considered to be random and inference pertains to the population where a sample was randomly drawn (Xit are independent of μi and vit for all i and t). In addition, if the random effect assumptions hold, the model can be more suitable due to its flexibility and generalizability. Therefore, a random effect model can be more appropriate if data consist of a given sample drawn from a large population. In fact, the suitability of the random effect model is justified when there is a likelihood that the differences across entities are believed to affect the predictor variables. Tauringana and Afrifa (2013), note that the variation across countries is randomly uncorrelated in the model.

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3.5.3 Model Diagnostic Test

Model diagnostic or robustness test is necessary to avoid reporting spurious results. Therefore, to ascertain goodness fit of the model, the diagnostic tests of heteroscedasticity, multicollinearity and normality of residuals are conducted to ensure the model has all the desired econometric properties. To be more specific, the modified Wald test was used to check for heteroscedasticity problem while the variance inflation factor (VIF) test was employed to check whether the model is free from multi-collinearity problem.

Moreover, the Hausman specification test was applied to select a proper method of estimation between pooled mean group and mean group models. The pooled mean group model will be suitable when the probability value of the chi-square is greater than 5%. The null hypothesis states that the change in coefficients between the MG and PMG models are not statistically different and that PMG is more suitable under the homogeneity hypothesis. The standard Hausman (1978) specification test is employed to check for homogeneity in the long-run parameter estimates and whether pooling of the long-run coefficient is appropriate for this study.

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3.6 Chapter Summary

This chapter describes the methodological approach used to attain the objectives of the study. Specifically, this study consists of twelve African stock exchanges selected based on the availability of data. This study is underpinned to the asset pricing theory that links the explanatory variables to stock market development. To be more specific, the Arbitrage

Pricing Theory (APT) of Ross (1976) as a multiple risk factor asset pricing model represents the underpinning theory of the present study.

Considering the multidimensional nature of stock market development, this study employed a principal component analysis (PCA) and constructed a composite index that captures market capitalization, the stock traded value and turnover ratio as major indicators of stock market development. The reason for using a composite index can be traced to the argument of Levine (2005) that no single indicator can capture the entire stock market development. Similarly, there are six hypotheses tested representing the independent variables of this study. Due to the uncertainty and declining investor confidence on the African stock exchanges, this study control for a structural break to proxy for the effect of the 2008 global financial crisis. It also controls for the effect of exchange rates and interest rates on stock market development.

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Since the scope of this study covers 21 years (1996-2016), there is a likelihood that the variables selected will follow a unit root process (Nelson & Plosser, 1982). Therefore, this study employs the Im, Pesaran and Shin (IPS) unit root test to determine the order of integration of the series in the data set. Although the test to determine the integration of variables is not necessary when estimating the pooled mean group (PMG) model as long as the series are I(*0*) and I(*1*) or mixed (Pesaran & Smith, 1995; Pesaran et al., 1999), the test was conducted to confirm that none of the series exceeds I(*1*) order of integration.[18]

[18] See Asteriou and Monastriotis (2004) for details

Moreover, the PMG is the main model employed to answer the research questions of this study. The justification for estimating PMG is that the technique has several advantages over the traditional/static panel models. It is the most appropriate model when a period of study exceeds the number of cross sections (T>N). Due to common features of the African economies, the model is suitable as their similarity is expected to impact on the long-term coefficient in a similar way when the homogeneity assumption holds. In other words, the model has additional advantages over other heterogeneous models as it constrains the long-run estimates to be similar regardless of the order of integration of the variables.

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CHAPTER FOUR
RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents and discusses the findings of this study that employs a sample of 12 African Stock Exchanges for the period spanning 1996 to 2016. The chapter reports the descriptive analysis comprising of both descriptive statistics and the correlation analysis. It also reports the results of the stationarity test of Im, Pesaran, and Shin (2003). The chapter employs the panel dynamic model of pooled mean group (PMG)/ panel autoregressive distributed lag (ARDL) as the main model of the study. The chapter also estimates the diagnostic and robustness test/sensitivity analysis to confirm the strength and efficiency of the estimates.

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4.2 Descriptive Analysis

This study conducts a descriptive analysis to give a detail characteristic of the data. The analysis includes descriptive statistics and the correlation analysis as presented in tables 4.1 and 4.2 respectively.

Table 4.1

Descriptive Statistics

Statistics	SMD	RQ	BD	LEP	PVR	UN	EXG	ER	IR	BRK
Mean	-8.330998	-0.185352	31.96420	60.30464	7.074152	11.07810	32.11129	255.9719	17.77152	0.428571
Maximum	6.020526	1.123364	106.2603	75.78515	8.826388	37.60000	68.45676	3610.5	56.16667	1.000000
Minimum	-0.395204	-1.322825	2.746888	44.45266	5.553794	1.456000	9.639048	.1754386	0.770001	0.000000
Std. Dev.	1.000012	0.463985	24.58799	9.555345	0.856351	6.895630	12.51960	595.3774	10.55857	0.495856
Skewness	3.645366	0.403545	0.825998	0.130666	0.216973	1.339118	0.493450	3.232864	1.467219	0.288675
Kurtosis	7.494930	3.068290	2.691870	1.667742	2.053285	4.310770	2.751092	13.73662	5.310310	1.083333
Observations	252	252	252	252	252	252	252	252	252	252

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4.2.1 Descriptive Statistics

The stock market development (SMD) is the dependent variable while the independent variables are regulatory quality (RQ), banking development (BD), life expectancy (LEP), poverty reduction (PVR), unemployment (UN) and export growth (EXG). In addition, exchange rates (ER), interest rates (IR) and break (BRK) are the control variables of the present study. Emphasis was given on the importance of descriptive statistics as it can be used to discern the behavior of data and make a comparison with the required standard (Lawless & Heymann, 2010). Thus, this study considers the mean, standard deviation, minimum, maximum, skewness and kurtosis.

To further clarify the properties of descriptive statistics, Oja (2016) disclosed that the skewness and kurtosis are considered as secondary statistics that uncover the stability of primary statistics. Thus, studying the skewness and kurtosis becomes necessary when a normal curve did not adequately give a true representation of data. Specifically, the essence of skewness statistics is to show how data is distributed around a curve while the kurtosis indicates the sharpness of data distribution. Hence, a positively skewed (plakurtic) data is the one where the distribution favors the right side of a normal curve while a negatively skewed (leptukurtic) data shows a distribution in favor of the left side of a curve. However, a highly skewed data is not desirable as it did not truly represent a normal distribution. It is expected to be normally distributed as reveal in the previous literature (Barato & Seifert, 2015).

Table 4.1 reveals that the stock market development (SMD) of the sampled African countries has a mean of -8.33, with a minimum value of -0.39 and a maximum of 6.02. The standard deviation value of 1.836 indicates average normality in variation from the mean value. The value of 3.64 and 7.49 respectively represent the skewness and kurtosis of SMD which indicates that the data is expected to be normally distributed in line with the previous literature (Ryu, 2011). The low indices of market development is in line with the previous African studies of Boamah et al (2017) and Ntim et al. (2011). This is an indication of underdevelopment of stock market and may signal a potential divestment from the continent.

However, the highly unstable variable of this study is the exchange rate with a standard deviation of 595. This may be due to the widespread exchange rate fluctuation attributed to most African countries. It is worth noting that many of the African economies practiced a flexible exchange rate regime which is freely determined by market forces while some countries practiced a managed floating exchange rate. Also, the kurtosis statistics as shown in the table, has a maximum value of 13.73 for exchange rates variable which may be due to high volatility of exchange rate. This figure is higher than the range given in the previous literature (Bai & Ng, 2005). Although it is similar to previous African studies of Mbulawa (2015) for Zimbabwe with high currency fluctuation. The rise and fluctuation of the exchange rates entails macroeconomic instability in Africa which distracts investment and prosperity. In other words, the shocks in currency market destabilizes the return of firms in the African region.

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Furthermore, the annualized banking development (bank credit to private sector) for the sample countries has a minimum of 2.747 and the maximum stood at 106.260 with an average of 31.96. It is the second widely dispersed series with a standard deviation of 24.58. The high dispersion of the variable is in line with the previous African study of Nyamongo et al. (2012). The implication is that previous policies fail to adequately accommodate the rising demand of financial resources by the private sector making it difficult to finance investment. This is not desirable and needs to be addressed so that domestic firms can afford to approach financial institutions for loans and other financial services. In a credit-creating financial system however, banks provide credit for investment in real sector of economies. To achieve the goal of financial system development, both banks and stock market should be complementary in supporting the real economic sectors.

Similarly, the mean value of regulatory quality (RQ) is -0.18 while the maximum and minimum are 1.12 and -1.32 respectively. The standard deviation value of 0.463 is not too far from the mean distribution of the data hence it can be a reliable figure as far as data distribution is a concern. The values of 0.40 and 3.06 respectively represents the skewness and kurtosis of the RQ data which is an indication of expected normality. The RQ index represents the government ability to articulate and execute sound policies to support private sector investment. This low index indicates poor regulation of financial markets which is not desirable for countries aiming for sustainable market development. The implication is that a weak securities regulation can discourage both domestic and foreign investment and if not addressed holistically can result in further loss of portfolio investors (Morrissey & Udomkerdmongkol, 2012).

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The remaining series also reveals a similar pattern. For example, the average life expectancy represents 59.443 years with a maximum of 75.785 and a minimum of 44.45 years which is similar to the previous African study of Ssozi and Amlani (2015). The implication of the lower average life expectancy is that household may not sacrifice their current consumption to make future investment due to the probability of early death. Intuitively, longevity can be an additional incentive for household to make saving and future investment which can cater for their after-retirement consumption.

Similarly, the skewness of 0.13 and kurtosis of 1.66 values for life expectancy variable fall within the expected range. Thus, the data is expected to be normal despite the average life span in African region is lower than those in advanced economies (Geanakoplos et al., 2004). Intuitively, when an individual life span is high, there is a likelihood of investment in human capital development to accelerate development of stock market. The more investor expects longer life, the greater possibility of saving for future investment in capital market. However, the low level of life expectancy in the sampled countries may not be unrelated to inadequate health care facilities confronted by most African countries.

Furthermore, the average value of poverty reduction is 7.07 while 8.82, 5.55 and 0.85 are the maximum, minimum and standard deviation values respectively. The skewness value of 0.21, is an expectation of normal distribution of the data. Additionally, the kurtosis value of 2.05 means the peakedness of the distribution is expected to be normal in line with the expectation as explained in the other variables.

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Moreover, the average value of annual unemployment rate is 11.08, a maximum rate of 37.60, and a minimum of 1.456 with a standard deviation of 6.89. The standard deviation value is not too far from the mean value which is expected to be relied upon. However, the unemployment rate in Africa is higher compared to what is obtainable in advanced nations. This is similar to what was reported in the Baa-baoteng (2016) for the level of African youth unemployment. The implication is that a high unemployment rate leads to decline in income with a likely fall in demand for goods and services, revenue and market returns. Hence, there is need for urgent policy framework to reduce the high level of joblessness among the educated African youth before degenerating to destruction.

The export growth has an average value of 32.1, a maximum of 68.45 with a minimum of 9.63. The table further shows a skewness value of 0.49 which is within the range for normal distribution. The standard deviation of 15.5 for the export growth variable is an indication of dispersion among the African countries. This is similar to Menyah et al. (2014) that shows lack of stability in the export sector of the African region. In fact, the export is dominated by primary commodities with marginal level of manufacturing export despite it was stated that export is a key to growth and development (Lorde, 2011). Hence, expansion of export horizon in Africa has the potential of promoting infant industries and their value of shares.

Besides, the interest rate has an average of 17.77 and a maximum of 56.167. This is against the usual single-digit lending interest rate in most developed and other non-African developing nations. The high lending interest rate discourages investors to borrow for

investment while it encourages savings due to the anticipated higher return to savers. In other words, the higher rate makes credit expensive for potential borrowers for their investment. The standard deviation of 10.5 indicates the level of dispersion of the lending rates across African countries which is not effective for investment and is in line with the study of Allen et al. (2011). The implication is that there will be low level of economic activities as cost of borrowing affect future cashflows and profitability of firms.

However, skewness and kurtosis were employed to check for normality of data distribution. The series that has a maximum skewness of 3.64 is stock market development while the least skewed series is life expectancy with 0.13 though the test is different from the threshold value of zero. Nevertheless, the descriptive statistics is only an explanation of the raw series which may not be employed to draw any conclusion regarding the stock market development. Despite the parametric statistic unveils the nature of data normality, Blanca et al. (2013) contend that the outcome is not sufficient to conclude that data is normally distributed. In other words, the information obtained under descriptive statistics can be deceptive and there is a need for a further test to check the normality distribution of data. Moreover, the study confirms the possible factors that influence stock market development based on inferential statistics which can be evidently used to make a reasonable conclusion.

4.2.2 Correlation and Multicollinearity Analysis

The essence of correlation analysis is to establish a direction and intensity of a relationship between a dependent and independent variable. Based on the existing literature, this section shows if there is any likelihood of the presence of high-order correlation (multicollinearity) among the independent series of this study.

Table 4.2
Correlation Matrix

VAR	smd	rq	bd	lep	pvr	un	exg	er	ir	break
smd	1.0000									
rq	0.3759*	1.0000								
	(0.0000)	-								
bd	0.4851*	0.7070*	1.0000							
	(0.0000)	(0.0000)	-							
lep	0.3950*	0.3079*	0.3119*	1.0000						
	(0.0000)	(0.0000)	(0.0000)	-						
pvr	0.4383*	0.5810*	0.8738*	0.2111*	1.0000					
	(0.0000)	(0.0000)	(0.0000)	(0.0007)	-					
un	0.5022*	0.3639*	0.4775*	0.0843	0.5595*	1.0000				
	(0.0000)	(0.0000)	(0.0000)	(0.1822)	(0.0000)	-				
exg	-0.0720	0.2479*	0.3443*	0.0332	0.4855*	0.1603*	1.0000			
	(0.2546)	(0.0001)	(0.0000)	(0.5998)	(0.0000)	(0.0108)	-			
er	-0.1536*	-0.0814	-0.3281*	-0.2536*	-0.4240*	-0.4086*	-0.3070*	1.0000		
	(0.0147)	(0.1977)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	-		
ir	-0.1855*	-0.1740*	-0.4133*	0.3029*	-0.5003*	-0.2045*	-0.2583*	0.0585	1.0000	
	(0.0031)	(0.0056)	(0.0000)	(0.0000)	(0.0000)	(0.0011)	(0.0000)	(0.3547)	-	
break	0.0837	-0.0011	0.1502*	0.2637*	0.1614*	-0.0132	-0.0058	0.0937	-0.2570*	1.0000
	(0.1855)	(0.9860)	(0.0170)	(0.0000)	(0.0103)	(0.8344)	(0.9267)	(0.1381)	(0.0000)	-

Note: SMD, RQ, BD, LEP, PVR, UN EXG ER, IR, and BRK represent stock market development, regulatory quality, banking development, life expectancy, poverty reduction, unemployment, export growth, exchange rates, interest rates and structural break respectively. The values in parenthesis are the probability value of the correlation coefficients while * indicates a statistically significant correlation.

Source: *Author's Computation*

Table 4.2 exhibits the correlation coefficient and individual probability values for each pair of the association among the series. The coefficients are an earlier indication for the likelihood of significant nexus between explained and the explanatory variables. For example, the correlation coefficient between the banking sector development (BD) and poverty reduction (PVR) was 0.87 which indicates a strong and statistically significant correlation. The second highest correlation coefficient was 0.7 between the regulatory quality (RQ) and the BD also statistically significant. However, the stated correlation does not expose the model to the problem of multicollinearity as Hair, Black, Babin, and Anderson (2009) disclose that the multicollinearity issue can only be encountered if the correlation coefficient is greater than 0.9.

Moreover, the degree of correlation between stock market development (SMD) and the RQ has a coefficient of 0.37 and is statistically significant. Similarly, the BD and SMD are correlated at 0.48 also statistically significant. The degree of association between life expectancy (LEP) and the SMD has a coefficient of 0.39 and is statistically significant while the UN and the SMD degree of correlation has a coefficient of 0.43. The PVR variable on the other hand has a 0.5 correlation with the SMD at statistical level of significance.

Furthermore, the level of association between export growth (EXG) and SMD has a coefficient of 0.07 though is not statistically significant while the exchange rates (ER) variable is correlated with SMD with a value of 0.15. The independent variables of this study are also significantly correlated. The RQ variable correlation with BD, LEP PVR and UN is 0.7, 0.3, 0.5 and 0.36 respectively all is statistically significant. On the other hand, the coefficients of 0.31, 0.87, 0.47, 0.34, 0.32 and 0.41 represent a

correlation between the BD with LEP, UN, EXG, ER and IR respectively all are statistically significant.

Moreover, the LEP is correlated with all the control variables (ER, IR BRK) though the LEP has no significant correlation with UN and EXG as reveal from the probability value. In addition, the PVR variable is correlated with the UN, EXG, ER and IR with statistical level of significance. There is no significant correlation between ER and BRK as well as between ER and IR based on the correlation matrix. However, the non-significant correlation between some variables as reported earlier is in line with the study of Tsagkanos (2017) that investigate the relationship between income inequality and stock market development in Greece. Nevertheless, the correlation coefficient only displays a direction and strength of correlation which cannot be used for a causal relationship or for strong inferential evidence.

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Needless to say, a further test is necessary to confirm the presence of multicollinearity when a strong correlation exists among the explanatory variables. For example, Grewal, Cote and Baumgartner (2004) argue for the need of multicollinearity test when there is a strong correlation of at least 0.7 among the explanatory variables. Despite the correlation of this study are mostly less than 0.7, a further analysis was conducted to confirm the efficiency of result. Specifically, the present study employs a variance inflation factor (VIF) to fulfill the requirement and confirm whether the variables are multicollinearity free (Shieh, 2010).

It is worthy of noting that a high value of variance inflation factor (VIF) indicates a high degree of multicollinearity among explanatory variables. The examination of a correlation matrix of a given set of variables is a precondition for multicollinearity detection. Hair et al. (2009) and Tabachnick and Fidell (2007) stated that the correlation matrix between independent variables should not exceed 0.9. Hence, the issue of multicollinearity among the series for this study does not have much concern. The VIF of this study further confirms no multicollinearity problem with an average of 2.84 which falls within the range and is presented in Table 4.3.

Table 4.3
Test of Multicollinearity

Variables	**VIF**	**1/VIF**
PVR	6.74	0.148331
BD	6.20	0.161346
RQ	2.41	0.415117
IR	2.08	0.480384
LEP	1.95	0.513224
UN	1.68	0.595206
ER	1.66	0.601347
EXG	1.46	0.683593
BRK	1.42	0.705613
Mean VIF	2.84	

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4.3 Inferential Statistics

As discussed in subsections, the inferential analysis is conducted to draw inference for the six hypotheses of this study. This include unit root test, PMG as the main model and sensitivity analysis to confirm the strength of the main findings.

4.3.1 Panel Unit Root

The panel unit root is the first condition to estimate the long-run relationship between the stock market development and its explanatory variables. As presented in Table 4.4, the study employs the Im, Pesaran and Shin (IPS) where the test reveals that some of the variables are stationary at level apart from the stock market development (SMD), life expectancy (LEP), poverty reduction (PVR) and the exchange rates (ER). To confirm the variable level of integration, the t-statistics value should be greater than the critical value at all the conventional level of significance (1%, 5% and 10%). However, some variables support the hypothesis of unit root across countries as well as the hypothesis of zero order integration in the first difference. Since the explained variable (SMD) is integrated of order one, the pooled mean group (PMG) is the most suitable model for this study to estimate the long-run relationship (Pesaran et al., 1999).

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Table 4.4
Panel Unit Root Test

	Im, Pesaran and Shin			
	I(*0*)		I(*1*)	
Variables	Constant	Constant & Trend	Constant	Constant & Trend
SMD	-1.253	-1.701	-2.98***	-2.99***
RQ	1.470	-1.833*	4.060***	-4.09***
BD	-1.138	-2.252**	-4.20***	4.145***
LEP	-0.183	-0.346	-3.82***	-3.96***
PVR	-0.271	-1.698	-4.28***	-4.41***
UN	-2.249**	-2.615**	-4.96***	-5.03***
EXG	-1.405	-2.196**	-4.61***	-4.62***
ER	-1.282	-1.805	-3.24***	-3.23***
IR	1.981**	-1.859*	-3.74***	-4.01***
BRK	-0.809	-2.089**	-4.35***	-4.23***

Note: ****, ** and * indicate rejection of the null hypothesis at 1%, 5% and 10% levels of significance, respectively.

4.3.2 Pooled Mean Group (PMG) Model

In most cases, the statistical relationship keeps changing and the panel data allows researchers to better understand the dynamics of adjustment. The dynamic panel models contain lagged dependent variables as a regressor and the cross-sectional effect in their estimates. In a related study, Erik (2017) asserts that the opportunity to handle models with lagged responses is one of the major advantages of panel data over a pure cross-sectional data. The author further states that information concerning the individuals or period specific differences is among key restrictions of a cross section and time series analysis respectively. These limitations are overcome using dynamic panel data models that contain a set of regressors (including a lagged dependent variable), the individual/cross section effect and the regressor errors. Additionally, Pesaran (2015) reveals that the PMG is more appropriate for a long panel data thus employing the model for a small t dataset leads to a downward bias on the parameters of the lag dependent variable.

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The pooled mean group (PMG) model was first introduced by Pesaran et al. (1999) which allows errors and coefficients to vary across groups. As the name implies, the model involves both pooling and averaging in addition to making both a long-run and short-run estimates. The PMG is estimated using a maximum likelihood (ML) estimator where the error correction term (ECT) is expected to be negative and statistically significant. Furthermore, the PMG is suitable when there are reasons to expect homogeneity among the variables in the long run across the sample countries. In other words, the model considers long-run homogeneity and short-run heterogeneity in the parameter estimates. Jouini (2014) stresses that the PMG model

provides a stable and efficient long run estimates when the parameter homogeneity assumption holds. In fact, Asafu-Adjaye et al. (2016) state that the use of PMG model does not explicitly depend on the presence of co-integration.

The basic panel data assumption is that at least some of the parameters are same across entities. Thus, a serious bias and possible size distortion are possible if the pooling assumption does not hold true (Pesaran & Smith, 1995). It is also stressed that if the slope of coefficients is not identical, the estimates of average values of the parameters especially in the fixed effect, instrumental variable, and generalized methods of moments may be unreliable and misleading (Pesaran et al., 1999; Pesaran & Smith, 1995).

One of the central arguments from the findings of panel analysis with a larger entities than a number of period (N>T) is that the assumption of homogeneity of slope parameters is often inappropriate, rather, parameters are heterogeneous across entities. Blackburn and Frank (2007) stressed that the small-time panel estimation relies on fixed effect, random effect, instrumental variable and generalized method of moments. Similarly, Phillips and Moon (2000) affirm that the availability of a large time and a large number of cross-sections facilitates new studies of the dynamic panel data analysis.

Hence, this study employs the panel technique to account for consistency in the coefficients of the long-run estimates. The method separates estimates of regressions for every entity in addition to estimates of the average country-specific coefficients

(Evans, 1997; Lee, Pesaran, & Smith, 1997). Pesaran et al. (1999) further disclose that the pooled mean group allows the intercept, error variance and short-run coefficients to vary across entities while constraining the long-run coefficient to be similar across entities. This might be explained by the nature of stock market of the selected African countries which can influence the long-run coefficients in a similar way.

4.3.3 Estimation and Discussion

The estimated result of the PMG model is empirically presented in stages including lag length selection, the test for homogeneity of error variance to ensure the appropriateness of employing the model, the long run estimates of the model and the speed of adjustment to measure how the system returns to its long-run equilibrium.

4.3.3.1 Lag Length Selection

The lag length selection is conducted by comparing various models estimated with different lag length. This is necessary because the pooled mean group requires selection of a suitable lag for the equations of individual countries. The various lag lengths estimated to determine the suitable model is depicted in Table 4.5:

Table 4.5
PMG Lag Length Selection

Model	ARDL order	AIC	SBC
1	(1,0,0,0,0,0,0,0,0)	-1982.661	-2011.146
2	(1,1,1,1,1,1,1,1,1)	-1982.785	-2011.230
3	(2,1,1,1,1,1,1,1,1)	-2095.933	-2124.008

An appropriate lag is selected based on the minimum value of Akaike Information Criteria (AIC) and Schwarz Bayesian Criteria (SBC). For the present study, the minimum values of the information criteria indicate model 3 as the most appropriate

model. This is revealed from the least values of the selected lag length and the estimable model for this study is chosen to be PMG of orders (2,1,1,1,1,1,1).

4.3.3.2 Homogeneity of Variance

There are good reasons to believe in common long run coefficient across the African countries bearing in mind their similar features. Since the Pesaran et al. (1999) has the assumption that when error terms are serially uncorrelated, the parameters of the long-run relationship are assumed to be similar across countries. In other words, the long run coefficients are expected to be homogenous for all the cross sections. Similarly, Pesaran (2015) observes that different countries/regions with diverse historical and cultural background could all converge to the same economic equilibrium in the long run as a result of the forces of arbitrage and inter-connections via international trade and cultural exchanges.

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The long run homogeneity assumption specifies that both the mean group (MG) and the pooled mean group (PMG) models are consistent estimates but the PMG is the most efficient estimator. The null hypothesis states that a change in coefficients between the MG and PMG models are not statistically different and that PMG is more suitable under the homogeneity hypothesis. The standard Hausman (1978) specification test is employed to check for homogeneity in the long-run parameter estimates and whether pooling of the long-run coefficient is appropriate for this study. Fromentin (2016) posits that the difference between the PMG and MG models is on the degree of homogeneity applied to coefficients. Based on the Hausman specification test, the long run homogeneity restriction cannot be rejected indicating

the efficiency of PMG over the MG model. Kim et al. (2010) assert that if the long run homogeneity assumptions hold, the maximum likelihood-based PMG model will be efficient.

The results of the Hausman test presented underneath Table 4.6 has a non-significant probability value of 0.778. This indicates the efficiency of the PMG over the MG model for this study. Moreover, the model has additional advantages over other panel techniques as it allows the intercept, short-run coefficient and the error variance to differ (as would the mean group model) but constraints the long-run coefficient to be similar (as would the dynamic fixed effect model). However, for the PMG model, only the long-run parameter estimate and speed of adjustment coefficient (error correction term) are of interest (Blackburn & Frank, 2007) thus the result is presented in Table 4.6.

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Table 4.6

Pooled Estimate of ARDL (2,1,1,1,1,1,1): Dependent Variable: Stock Market Development

Variables	Model A MG	Model B PMG	Model C DFE
RQ	-0.635	1.098**	0.666
	(1.463)	(0.317)	(0.053)
	[-0.43]	[3.46]	[1.25]
BD	-0.031	-0.011*	0.011
	(0.053)	(0.006)	(0.012)
	[-0.58]	[-1.76]	[0.92]
LEP	-0.871	0.041**	0.066*
	(0.977)	(0.014)	(0.038)
	[-0.89]	[2.85]	[1.74]
PVR	-0.549	1.151**	2.452**
	(4.469)	(0.385)	(0.981)
	[-0.12]	[2.99]	[2.5]
UN	-0.086**	0.079**	-0.044
	(0.040)	(0.031)	(0.043)
	[-2.14]	[2.56]	[-1.03]
EXG	-0.076	0.012*	0.034**
	(0.082)	(0.007)	(0.016)
	[-0.93]	[1.72]	[2.14]
ER	0.038	0.003**	0.0001
	(0.226)	(0.001)	(0.0005)
	[1.36]	[2.92]	[0.29]
IR	-0.312	-0.052**	0.005
	(0.315)	(0.016)	(0.015)
	[-0.99]	[-3.21]	[0.34]
BRK	0.016	-1.335***	-1.678***
	(0.515)	(0.369)	(0.469)
	[-0.03]	[-3.62]	[-3.57]
Speed of Adjustment	-4.046	-0.151**	-0.171***
	(4.350)	(0.062)	(0.029)
	[-0.93]	[-2.40]	[-5.78]
Max. Log likelihood		655.04	-
No. of Countries	12	12	12
No. of observations		252	
Hausman Test		0.778	

Note: the value in parenthesis are asymptotic standard errors and t-statistics respectively, the asterisks ***, ** and * denoted significance level at 1%, 5% and 10% respectively.

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The main model of the present study is Pooled mean group. In view of the inconsistency problem in estimating traditional panel models, Pesaran et al. (1999) proposed the pooled mean group (PMG) model to overcome the limitation. Unlike the static panel models, the PMG model is an intermediate estimator that allows for heterogeneity of intercept, short run coefficients and the error variance while imposing a cross-country homogeneity restrictions only on the long run coefficients irrespective of whether the included series are I(0), I(1) or of mixed order integration. In addition, the PMG is estimated using a maximum likelihood (ML) estimator where the error correction term (ECT) is expected to be negative and statistically significant negative if the model exhibits a usual return to long-run equilibrium. The model relies on the combination of both pooling and averaging of coefficients. However, the primary interest of the PMG model estimation is the speed of adjustment (error correction term) and the coefficient of the long run estimates.

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The coefficient of lending interest rate (IR) reveals an inverse relationship with the stock market development and is statistically significant at one percent level. The result shows that a 1% increase in interest rate will lead to a decrease in the ratio of stock market development by -0.52 percentage points. The implication is that when interest rate is adjusted upward, the proportion of stock market development will decrease for the selected African countries. That is, higher interest rates discourage borrowing and investment in stock market. This finding is in line with Arbitrage Pricing Theory and the empirical findings of Amarasinghe (2015) that shows a negative relationship between stock price changes and interest rates.

The high significant level of the lending interest rate is an indication of the importance of economic forces in predicting stock market development. It has also disclosed how monetary policy intervention through lending rate can impact on the future cashflow of firms and their value of shares. Therefore, the African investors should pay attention to the movement of lending rate when formulating their portfolio diversification. It was stated that stability of economic forces is necessary in predicting stock market returns (Chen & Chiang, 2016). From the financial investment perspective, the knowledge about movement of interest rates would pave way to formulate policies that will ensure financial and macroeconomic stability. The reason is that future corporate earnings are related to the health/strength of economic forces. Accordingly, participants of financial market pay attention to underlying economic forces.

Furthermore, the study includes the 2008 global financial crisis in the estimation process to account for the existence of a structural change. The coefficient of the structural break is negatively related to stock market development and this suggests that the prevalence of the 2008 global financial crisis led to 1.335 fall in SMD for the sample countries. The coefficient is negative and statistically significant at 1% level. This reveals foreign investor are divesting from the region due to loss of confidence in the financial market. It is in line with the findings of Seck and Yoff (2016) that African stock markets would have been the best investment destination prior to the 2008 global financial crisis that causes a devastating effects.

Due to the devastating effect of financial crisis, previous studies describe the contagion in different standpoint. For example, the 2008 global financial crisis was described as

the most turbulent economic event in recent history (Kenourgious et al., 2016), it leads to a noticeable economic shock in the global financial market (Morales & Andreosso-O'Callaghan, 2014). In fact, the financial crisis led to a structural shift in financial market and the global economies causing a lot of tension and investment loss. However, uncertainty in the mind of investors aggravates the declining confidence in stock markets. Sum (2013) asserts that investor's confidence is a critical factor affecting stock market returns while Morales and Andreosso-O'Callaghan (2014) disclose that decline in foreign portfolio investment is an important transmission channel that the 2008 global financial crisis hit African countries.

However, the speed of adjustment of this study is found negative and statistically significant at 1% level indicating that about 15 percent of the deviations that occur among the countries in the short run will adjust back to equilibrium within the subsequent year. This is considered reasonable enough especially for African countries that are bedeviled with investment uncertainty and panic trading which partly affect the stability of foreign investment on the continent. The coefficient measures the reasonable length of time taken for deviation to adjust back to the equilibrium in the long run. Despite deviations usually occur in the short run, it is expected to adjust and revert back to equilibrium in the long run.

In addition, the coefficient of the regulatory quality indicates that a one percent change will lead to an increase in the stock market development by 1.09 which is statistically significant at 5% level. The finding suggests that an increase in quality of regulation will significantly improve the African stock market development. In other words,

enforcement of effective financial market regulation can increase investors' confidence and curtail inefficient financial disclosure that leads to confidence erosion in the financial market. Furthermore, a quality and effective regulation will increase the possibility of having a conducive investment environment devoid of information asymmetry and mismanagement of shareholders' funds. This finding falls within the purview of the Arbitrage Pricing Theory (APT) of Ross (1976) emphasizing that several factors can be used to explain asset returns. Thus, the stock market development in Africa is affected by multiple factors including the regulatory quality variable.

Despite insufficient empirical evidence on the relationship between regulatory quality and stock market development especially looking at the slow pace of African market development from the recent global financial crisis, the result is in line with the findings of Ng et al. (2015) that suggest a positive relationship between minority shareholders protection in the United States. Their finding reveals that a higher protection can lead to confidence enhancement thereby encouraging investors to participate in financial markets. Furthermore, the study of Demirgüç-kunt and Maksimovic (1998) found that an active stock market is positively related to improved legal system. The result also reveals that firms established in countries rated high for compliance in legitimate laws are able to access external finance.

The findings further disclose that the life expectancy and stock market development are positively related. Specifically, a 1-year increase in life expectancy will bring an increase to the stock market development by 0.041 percentage points at 5% significant

level. Interestingly, a longer lifetime boosts productivity and investment in financial markets. This finding is in line with the Arbitrage Pricing Theory that predicts the impact of risk factors on the asset prices. The results align with the empirical findings of Bakshi and Chen (1994) that suggest aging population positively affects stock prices. However, the other studies were on the relationship between life expectancy and economic growth (Hami, 2016; Kunze, 2014; Mahumud et al, 2013; Ngangue & Manfred, 2015). These studies suggest that life expectancy has a positive impact on economic growth.

Bloom and Canning (2008) assert that health is a vital instrument for raising income level while poor health condition tends to be connected to a shorter lifetime. Therefore, the probability of a short life can be detrimental to future savings and investment. In fact, the authors argue that most of the countries that suffer from a short life expectancy and diseases are also deprived of other economic benefits to improve people well-being.

Though the findings bear the APT theory of Ross (1976), it is contrary to the standard neo-classical model proposed by Solow (1956) that states an increased population can result to a decline in the land to labor and capital to labor ratio which is not desirable for sustainable growth. The Solow model was supported empirically by the Acemoglu and Johnson (2007) and Kunze (2014) studies which found that life expectancy exerts a negative impact on the growth of economies due to rise in tax burden and fall in per capita income.

The parameter estimates of poverty reduction (PVR) also reveals a positive impact on the stock market development at 5% significant level. Specifically, when the PVR is increased by 1%, it will raise the SMD by 1.15 percentage points. This finding indicates that the effort in reducing poverty level will impact positively on the development of stock market in Africa. Poverty is a critical factor that is so pervasive on the African continent with more than a half of the population living below the poverty line. This has become a serious setback inhibiting domestic investment in the region.

Despite Beck et al. (2004) observe that countries with well-developed financial intermediaries experience a speedy reduction in poverty, there is no empirical evidence on the impact of poverty reduction on stock market development. The previous studies were conducted on investigating the impact of financial development on poverty reduction (Batuo et al., 2010; Beck et al., 2004; Boukhatem, 2016). Their findings reveal the importance of a developed financial market in reducing poverty. Intuitively, as poverty reduces, there is a likelihood for households to have sufficient income to invest in stock markets. This can increase the level of domestic investment in Africa which is absolutely low and will serve as an added advantage to the stock markets that usually lose huge foreign investment in financial crisis period. However, the finding supports the suggestion of Beck et al. (2007) that poverty reduction may stimulate the demand of financial services.

In addition, unemployment (UN) and stock market development variables are positively related in Africa where a 1% increase in UN results in a corresponding

increase in SMD by 0.08 at 5% percent significant level. Impliedly, the release of unemployment can be good for stock market investors. Despite absence of empirical literature in Africa, the findings are in support of the Arbitrage Pricing Theory and some previous empirical studies (Fritsche & Pierdzioch, 2016; Holmes & Maghrebi, 2016). These studies report that making information of unemployment available induces government to cut down interest rates while the low interest rate could induce investors to borrow and invest in stock markets. The finding of this study is in line with the set hypothesis and the Arbitrage Pricing Theory.

In related studies, Blanchard (1981) extended IS-LM model and Boyd et al. (2005) predict the impact of unemployment on the stock market is predisposed to a prevailing economic condition of the affected countries. Therefore, unemployment news can be good during economic prosperity and bad in a recession period. In advanced economies, however, the release of unemployment exerts a significant change in investor sentiment. This indicates the relevance of macroeconomic news to stock market investment. In fact, Birz and Dutta (2016) assert that the employment/unemployment announcement is among the most crucial announcements affecting stock markets.

Moreover, the coefficient of exchange rate (ER) shows a positive and statistically significant relationship with the stock market development (SMD). It reveals that an increase in ER by 1% leads to a corresponding increase in SMD by 0.003 percent at 5% level of significance. The implication is that exchange rate depreciation can encourage foreign investors' participation in capital market with the expectation of

excess future earnings. The result of the present study corroborate the work of Koulakiotis et al. (2015) and Senturk and Ducan (2014) that found a significant positive relationship.

Furthermore, the findings reveal that 1% increase in export growth (EXG) will lead to 0.012 increase in SMD and is statistically significant at 10% level. The findings reveal that export growth is a good predictor for stock market in Africa. In other words, the share value of the African firms in export activities will appreciate and this can motivate prospective investors to Africa that is far behind in terms of export earnings and financial market development. Needless to say, however, there is no country (including advanced nations) that is self-reliant with respect to trading, investment and other aspects of economic activities. This finding is a good development for the African nations that are mostly import-dependent with a high trade deficit and a rising cost of living due to imported inflation (Jouini, 2014).

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Additionally, the firms' export growth can translate to economic expansion due to the inflow of foreign exchange and investment. There will be a rise in economic activities, increase in trade balance and a significant decline of importation due to the increased output and sales proceed from export. Despite the insufficient studies on the export-stock market development, the finding of this study is closely related to the export-led growth literature (Gustavsson & Ljungwall, 2012; Lorde, 2011; Seraphin & Yinguo, 2015) that gives emphasis on the benefit of export to economic growth. Expectedly, however, the African countries stand to benefit through an increase in export earnings

that could bring in more foreign exchange and investment as well as promotes the production of high-quality processed goods.

Moreover, the relationship between banking development and the stock market is negative and statistically significant. An increase in banking development by 1% will cause a decrease in stock market development by 0.011 percentage points at 10% significance level. In other words, the finding uncovers that banking development and stock market development in Africa are substitute for providing financial services to the real sector. This shows the dominance of the banking services in most of the developing economies including Africa at the expense of stock market development. This is in support of Stiglitz (1985) model that shows banks and stock markets are alternative sources of finance for investment as they are substitute in providing services to their customers. However, the findings lend support to the Arbitrage Pricing Theory that multiple risk factors explain changes in stock market development.

Although there are insufficient empirical evidence on the substitutability hypothesis of the banking development and stock market development, the findings of Ho (2017) using Malaysian data supports the theoretical argument that banks and stock markets are substitutes in providing financial services. Hence, the African financial system is highly dominated by the banking sector where many investors rely primarily on banks for sourcing finances despite a high-interest rates charges on loans. In other words, the African financial system is dominated by banks rather than stock markets. Intuitively, with effective and liquid stock markets, the African investors can deviate from the existing short-term high-interest loans to a long-term financing in the capital markets.

In contrast, the empirical findings of other studies (Almutai, 2015; Ayaydin & Baltaci, 2013; Nyasha & Odhiambo, 2015) suggest that banks and stock markets are complementary in boosting economic development. This is usually common in advanced economies supporting the complementarity hypothesis that the development of one tends to bring more development of the other. Therefore, countries with a well-developed financial intermediary also tend to have a relatively developed equity market. It seems an increase in stock market signifies an increase in economic activities. The findings lend support to the Arbitrage Pricing Theory of Ross (1976) that securities returns are affected by multiple risk factors.

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4.4 Sensitivity/Robustness Analysis

For sensitivity analysis, the study considers exclusion of the South African Stock exchange which is seen to be the relatively developed market in Africa. The omission of the South Africa stock market will serve as robustness checks in line with the study of Lee and Wang (2015). This is to further check the existence and magnitude of the relationship between the stock market development and the variables of interest of this study. The pooled mean group sensitivity results as presented in Appendix L disclose how the coefficient of the new estimate behaves after modifying the model. Thus Lu and White (2014) disclose that if the sign of the estimated parameters remains stable, it is an evidence that the main result can be reliably interpreted as a true causal effect between the regressors and dependent variable for policy analysis.

Interestingly, the sensitivity results are similar to the main model in terms of the sign with little variation of the coefficients. In fact, the coefficient of the error correction term (ECT)/speed of adjustment remains negative and statistically significant consistent similar to the main model. Another interesting series is the structural break due to the last global financial crisis (GFC) whose coefficient also remains negative and statistically significant. This is showing the devastating effect of financial crisis on the financial markets. In line with the findings of Adams and Klobodu (2016) and Jouini (2014), the coefficient of the robustness test confirms the main findings of the model as the results hold even after removing the South African Stock Market that is relatively developed in the African region (See Appendix L).

4.4.1 Model selection criteria

This section makes emphasis on the appropriate models to be estimated based on fulfilling a certain selection criterion. In other words, each of these models is associated with underlying characteristics which must be satisfied for estimates of the models to be efficient, reliable and unbiased (Gelman & Hill, 2007).

Although the African stock markets share relatively similar features regarding their market capitalization, liquidity and volume of trade, it is necessary to consider and make an appropriate selection among the various alternative panel estimation techniques. This study employs the Hausman (1978) based test to determine the heterogeneity effect on the mean of the coefficients. The null hypothesis reveals that variation in the coefficients between the mean group (MG) and the pooled mean group (PMG) are statistically similar and that the PMG is more suitable and efficient.

Therefore, the most appropriate estimate for this study is the PMG/Panel Autoregressive Distributed Lag model coefficients. The results of the Hausman test is presented beneath Table 4.6

The results further indicate that when homogeneity assumption is imposed on the long run coefficients, the PMG model is more appropriate and has additional advantage over the mean group and the dynamic fixed effect (DFE) where it allows the dynamic specification to differ among countries in the short run. Therefore, it is imperative to underscore that the estimates are robust to misspecification bias. The reason is that, in addition to the lag length selection, the time length is found larger than the entities.

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4.4.2 Diagnostic Tests

To avoid reporting a spurious regression, there is a need for post-estimation tests otherwise referred to as diagnostic test. For example, the Wooldridge (2002). autocorrelation test is conducted in line with the suggestions of the previous literature (Drukker, 2003; Gong, Li, & Wang, 2011) in order to confirm the consistency of the estimates. Furthermore, the heteroscedasticity test is necessary after estimating a linear regression model. The assumption of linearity is that the model is required to be free of heteroscedasticity problem or the model should be homoscedastic (Flachaire, 2005). Therefore, this study conducted the Breusch Pagan test of heteroscedasticity with a null hypothesis of a constant variance among the model residuals. It is necessary to check for the existence of constant variance (Patriota, Lemonte, & Bolfarine, 2011).The authors further disclose the need for treating model parameters to

circumvent inconsistent estimators particularly when variables are subject to measurement errors.

However, the normality distribution of data is among important assumptions of a linear regression where the data is expected to be normally distributed which is conducted on the residuals of the model. The violation of normality assumption leads to interpretation and inference to be invalid and unreliable (Park, 2008). In fact, for a test to stand for generalization, the data of the series should be distributed normally.

As recommended in previous studies, the variance inflation factor (VIF) test was conducted to see whether the model is multicollinearity free (Hair et al., 2009) and Table 4.7 below presents the diagnostic tests conducted for this study.

Table 4.7
Diagnostic Tests

Test	**P value**
Heteroscedasticity	0.142
Autocorrelation	0.317
Normality	0.225
Mean VIF	2.84

As depicted above, the chi-square value is insignificant going by the probability value of the various tests conducted. For example, the heteroscedasticity test with a value of 0.142 fails to reject the proposed hypothesis of a constant variance among the residuals of the model. In other words, the model is homoscedastic or heteroscedasticity free and does not suffer any problem of a non-constant variance.

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Similarly, the Wooldridge autocorrelation test with a probability of 0.317 indicates a non-significance probability value. This indicates that the model is free of the first-order autocorrelation problem. In addition, the normality test also has a non-significant probability value of 0.225, signifying the residuals are normally distributed. Moreover, Table 4.8 reveals the results of the multicollinearity test conducted for this study. A multicollinearity problem occurs when there is a high correlation between independent variables. An extreme case of multicollinearity is referred to a singularity and when it is detected, Hair et al. (2009) recommend for omission of the affected variables to guard against reporting eventual inflation of standard error or resulting to reporting a spurious regression (Granger & Newbold, 1974; Phillips, 1986).

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4.5 Hypothesis Testing

This section addresses how the six (6) research hypotheses formulated for this study are tested. It shows the relevance of the variables of interest based on the sign and significance of the relationship with the dependent variable. Similarly, the findings lend support to the Arbitrage Pricing Theory as well as the prior empirical literature related to this study.

4.5.1 Relationship between Regulatory Quality and Stock Market Development

The hypothesis tests show regulatory quality and stock market development are significantly related. The coefficient of the PMG model discloses a positive and statistically significant nexus between the series at 5% level. This impliedly means for a stock market to attain development, sound and effective financial market policies are

necessary to promptly check for irregularities and fraudulent activities. In spite of the existing empirical literature in advanced countries (Eng et al., 2014; Ng et al., 2015) there is a dearth of empirical literature in the African region on the regulatory quality-stock market development nexus. Needless to say, however, a sound regulation brings sanity in stock markets and promotes investor's sentiment which is desirable for the development of stock markets in emerging economies.

Therefore, when markets are efficient, it is hard to gain abnormal return since investors cannot beat the market. This finding is consistent with the set hypothesis that regulation and stock market development are positively related. Despite evidence of the effectiveness of sound regulation, the Prevoo and Weel (2010) study report that in an efficient market, a regulation does not matter as information is already reflected in the prices of stocks. The existence of positive nexus is an indication of the informational inefficiency of the African stock markets. The hypothesis is supported by the long-run conditions of PMG.

4.5.2 Relationship between the Banking Sector and Stock Market Development

This hypothesis test how stock market is related to the banking sector development in Africa. The coefficient of the banking sector development exerts a negative and statistically significant effect on the stock market development at 10% level of significance, as depicted in Table 4.6. This finding confirms that the banking sector and stock markets in Africa are substitutes. It is in support of the substitutability hypothesis as predicted by the Stiglitz (1985) model that banks and stock markets are alternative vehicles for provision of financial services.

The negative bank-stock market relationship indicates that most of the African countries operate a bank-based financial system with little contribution of stock market to the financial system. This study confirms the findings of Ho (2017) that shows banks and stock markets have a negative nexus in developing countries in line with substitutability model. Conversely, most of the existing literature conducted in advanced economies lend support to the complementarity model of financial development. To be more specific, the countries that have well-developed banking sector are also doing well in terms of stock market development. The complementary hypothesis is supported empirically by several studies including but not limited to Beck and Levine (2004) Naceur et al. (2007) and Odhiambo (2010). Therefore, the hypothesis is supported by the long-run PMG results that African financial system is bank-based with a little patronage of the stock market.

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4.5.3 Relationship between Life Expectancy and Stock Market Development

The hypothesis states that life expectancy has a significant impact on stock market development. The result as presented in Table 4.6 reveals the coefficient of life expectancy is positive and statistically significant at 5% level. This finding suggests that an improvement in people's life expectancy will have a greater impact on the development of stock market and the more people live, the greater a possibility for investment in capital markets. The result corroborates to the Arbitrage Pricing Theory that predict a significant relationship between economic forces and stock market.

Despite insufficient evidence from the prior literature on how life expectancy predicts stock market, the result is consistent with the aging-stock market positive nexus

(Bakshi & Chen, 1994). Their study suggests a positive relationship and further reveals that countries suffering from short life expectancy and diseases are also deprived of other economic benefits to improve people well-being. Hence, the findings are in support of the set hypothesis of a positive link between the life expectancy and stock market development. However, the finding is contrary to the standard neo-classical model proposed by the Solow (1956) which predicts that, an increased population can result to a decline in the land to labor as well as capital to labor ratio.

4.5.4 Relationship between Poverty Reduction and Stock Market Development

The proposed hypothesis states that poverty reduction can predict stock market development in Africa at 5% level of significance. As depicted in Table 4.6, the coefficients disclose a positive and statistically significant relationship lending support to the Ross (1976) APT prediction. This indicates that with more poverty reduction policies, the African stock markets can be more developed because a household's additional income can be invested to earn more returns. The lower the poverty level, the more chances of making demand and investment in stock market. Despite the absence of empirical studies on the direct impact of poverty reduction on stock market development, the findings can be linked to the financial development-poverty reduction literature, (Dhrifi, 2013; Ho & Odhiambo, 2011) that report a positive relationship between the variables.

Furthermore, considering the adversity of poverty and low development of stock markets, in the African region, it becomes imperative to find a lasting solution to this issue. For example, Sun et al. (2013) assert that poor households with a tight financial

constraints could not invest in their children education, leading to inter-generational poverty. Therefore, the increasing access to financial resources will magnify economic prospects for the less privileged to fund investment. This study extends this line of research by looking at how poverty reduction contributes to the development of African stock markets. The findings provide evidence that poverty reduction can improve stock market development. The result is in line with the set hypothesis that poverty reduction stimulates stock market development in Africa.

4.5.5 Relationship between Unemployment and Stock Market Development

The formulated hypothesis states that unemployment is related to stock market development. The coefficient explains a positive and statistically significant relationship that an increase in UN will lead to increase SMD at 5% significant level. Impliedly, unemployment can be good for stock market investors. Despite absence of panel studies in Africa, the findings are in support of the formulated hypothesis and some previous empirical findings (Fritsche & Pierdzioch, 2016; Holmes & Maghrebi, 2016). Their findings suggest that making unemployment news available induces government to cut down interest rates which could motivate investors to borrow and invest in stock market. It is also supported by Pan (2018) that in developing countries, unemployment news is useful for forecasting stock prices. Therefore, stock markets are forward looking where future expectation can be reflected in prices.

Nevertheless, the Blanchard (1981) extended IS-LM model and Boyd et al. (2005) postulate that the impact of unemployment on stock market is predisposed to the prevailing economic condition of countries. That is, unemployment can be good

during economic prosperity and bad in a recession period. The PMG results is in line with the hypothesis and the Arbitrage Pricing Theory.

4.5.6 Relationship between Export Growth and Stock Market Development

The coefficient as presented in Table 4.6 reveals that export growth has a positive and statistically significant impact on stock market development at 10% level of significance. In spite the African export is highly on raw materials, the result suggests that increase in export can boost revenue, profitability and the share values of firms. When investors are informed about the opportunities, they will invest more to boost capitalization and liquidity of their firms. The findings are in line with the set hypothesis and the Arbitrage Pricing Theory that export predicts stock market development.

Despite absence of empirical findings on export growth-stock market development nexus, there are findings that suggest a significant relationship between export performance and economic growth (Easterly & Reshef, 2010; Njikam, 2017; Portugal-perez & Wilson, 2008; Yee, 2016). The studies suggest that, to improve the trade-related economic development potential for Africa, taking all-inclusive approach for harnessing and processing the abundant natural resources becomes a vital issue for consideration.

However, other empirical studies (Beck, 2003; Minetti & Zhu, 2011; Rajan & Zingales, 2008), investigate the effect of financial development on export and found the existence of a significant relationship. The studies revealed that financial

development is a crucial factor that explains firm's ability to engage in foreign export. This also shows that due to additional expenses, exports are highly contingent on finance rather than on domestic sales. The argument is that export can only be facilitated when there are strong financial institutions to make payment, offer credit facilities and other incentives to the exporting firms. Nevertheless, the hypothesis is supported that export and stock market development are positively related.

4.6 Summary of Hypothesis Testing

This study tests 6 hypotheses where the variables tested are regulatory quality, banking development, life expectancy, poverty reduction, unemployment and export growth. The results of the baseline PMG model disclose that all the aforementioned variables have significant impact on stock market development in Africa. Moreover, under the sensitivity analysis, the results give a similar sign for all the series irrespective of the magnitude of the coefficient.

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Table 4.8
Summary of the Outcomes of the Tested Hypotheses

	Hypothesis	**Sign**	**Results**	**Supported/Not Supported**
H1	Regulatory quality has significant impact on the stock market development in Africa	+	Significant Positive	Supported
H2	Banking Development has significant impact on the stock market development in Africa	-	Significant negative	Supported
H3	Life Expectancy has significant impact on the stock market development in Africa	+	Significant Positive	Supported
H4	Poverty Reduction has significant impact on the stock market development in Africa	+	Significant Positive	Supported
H5	Unemployment has significant impact on the stock market development in Africa	+	Significant Positive	Supported
H6	Export Growth has significant impact on the stock market development in Africa	+	Significant Positive	Supported

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4.7 Chapter Summary

This chapter establishes new evidence on the effect of regulation, banking development and selected economic forces on stock market development in the countries of Africa. It is found that regulatory quality contributes significantly to the development of the stock markets. A regulated market checked against market abuse, insubordination and promotes investors' confidence. Another key interesting finding is that, in Africa, banks and stock markets are substitutes contrary to the complementary link in the developed nations. This reflects the dominance of the banking sector in Africa with low development and awareness about the prospects of stock markets. Moreover, the selected economic forces of this study exert strong effects on stock market development. In fact, all the economic variables exert a positive and statistically significant impact on the African stock market.

The new evidence reported is in line with the set hypotheses and the underpinning Arbitrage Pricing Theory. Additionally, the control variables affect stock market development in Africa. to be more specific, financial crisis and lending interest rates have negative impacts on stock market while exchange rate is positively related to the stock market development.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This is the last chapter of this study examining the effects of regulation, banking development and selected economic forces on stock market development in the African countries. The chapter gives a summary of the key empirical findings of this study, its contribution to the existing literature and its relevance for the policy implementations. It also highlights the key challenges, limitations and suggestions for future research.

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5.2 Summary of Findings

This study consists of three objectives and six hypotheses for the period spanning 1996 to 2016. To be more specific, the third objective consists of four hypotheses and all the hypotheses of this study were tested using the pooled mean group (PMG) model.

The first objective examines the impact of regulation on stock market development in the selected African countries. The findings indicate that regulatory quality has a long-run positive and statistically significant impact on stock market development. A similar finding was obtained using the sensitivity analysis of the PMG model. This reveals the effectiveness of regulation to the development of financial market. The findings are in line with the Eng et al. (2013) that found a positive relationship between securities regulation and the volume of trading.

Hence, stock market cannot develop in the absence of a strong regulation protecting investors and the entire market against any form of market abuse/irregularities. The African continent's financial market has been slow in recovering from the aftermath of the 2008 global financial crisis (GFC). It would have attracted a huge investment when emphasis is given on protecting investors right and capital against future eventualities. Similarly, due to the suspicions in the financial markets, investors respond quickly against any crisis through panic trading and divestment. Thus, an unstable and less regulated investment environment can be a major threat to the stability and development of stock markets. Needless to say, however, the securities regulation can be against any form of information asymmetry, insider trading and a weak financial disclosure that impend the sentiment of investors.

The second objective investigates the impact of banking development on stock market development. The findings reveal that banking development has a negative and statistically significant link with the stock market. A similar negative relationship was obtained using the robustness/sensitivity model. The findings show that banks and stock markets are substitutes in Africa on rendering financial services to their customers though is contrary to the complementary relationship found in the advanced economies studies. In other words, banks and stock market in Africa are two alternative vehicles of financial system development in line with the Stiglitz (1985) bank-stock market substitutability model. The substitutability hypothesis found in Africa can be ascribed to the nature of financial system on the continent which is highly dominated by the banking sector at the detriment of stock market. In addition, the findings is in line with the Ho (2017) empirical studies that found banks and stock

market are inversely related in developing countries. This negative link may be as a result of low financial literacy on the importance of long-term investment in stock markets. In fact, the 2008 GFC intensified the declining investors' sentiment on the equity market in Africa. Despite its dominance, the banking sector is still not liquid to meet up the investors' illiquidity challenges.

The last objective investigates the impact of selected economic forces on stock market development. As stated earlier, this objective consists of four hypotheses where the first hypothesis tests the relationship between life expectancy and stock market development. The findings disclose a positive and statistically significant relationship between the variables. This indicates the importance of investors' longevity in making future investment in stock markets. Despite absence of empirical studies on this direct relationship, the findings conform with the Hami (2016) study that found life expectancy and economic growth are positively related.

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Hence, it could be argued that a longer life increases investors' confidence to delay their current consumption and make a long-term investment that promises future earnings. However, a shorter life expectancy induces consumption not minding the benefit of the long-term investment. Therefore, a short-term life expectancy is a threat to savings and investment in stock markets. A similar finding is obtained using the sensitivity analysis in terms of the significance of the coefficients.

The second hypothesis tests the impact of poverty reduction on stock market development. The empirical results uncover a statistically significant and positive

relationship between the series. In spite of the abject poverty challenging the African inhabitants, the results indicate a good prospect for the stock market development if proper measures are taken in reducing poverty. Poverty is among the most critical investment risk factors constraining the Africans to cater for their basic necessities. The poverty becomes intergenerational as parent could not afford to support their children education which inhibits human capital development. Though empirical studies on this relationship is inadequate, the finding supports Beck et al. (2004) that found a positive link between financial development and poverty reduction.

The relationship between unemployment and stock market development is also positive and statistically significant for both the long-run main model and the sensitivity analysis. Hence, unemployment rate is one of the crucial announcements affecting the stock markets. This shows that unemployment induces monetary authorities to take proper measures including expansionary policy of cutting down interest rates. Similarly, the positive reaction of stock market to unemployment reveals that a future expectation can be mirrored in equity prices. The findings corroborate with the empirical study of Holmes and Magrebi (2016) that suggest a positive link between labor market and capital market in the United States.

The last hypothesis found that export growth and stock market have a positive and statistically significant relationship. The long-run relationship indicates the growth of export enhances firms' future cash flows, profitability and share value of firms. In other words, firms' profitability depends on their export performance. Therefore, enhancement of firms' disposition to foreign trade is crucial for financial market

development. The import dependency of the African countries has several challenges including negative trade balance, imported inflation and the collapse of infant industries. However, the positive relationship is in line with the Regolo (2017) that found export growth and firms diversification are positively related. An increase in firms export unveils more opportunities to diversify to other viable economic sectors which can have a spillover effect on the entire economy.

The empirical findings of this study also uncover significant impact of the control variables of exchange rate, interest rate and financial crisis on stock market development. In particular, the findings confirm a positive and statistically significant relationship between exchange rate and stock market development in line with the Arbitrage Pricing Theory. The findings further reveal that both interest rate and financial crisis exert an inverse relationship with stock market development. In summary, all the control variables significantly entered the pooled mean group model.

5.3 Policy Implication of Findings

The policy implication of this study can be a turning point for the African stock markets that are small and illiquid compared to other developing stock markets. The findings disclose a positive and statistically significant nexus between the regulatory quality and stock market development. The implication is that African financial market cannot grow without strong and resilient financial regulations. Effective regulation protects investors and the entire market against irregularities and fraudulent transaction that could reduce investor sentiment of and fuel divestment from the region's financial market.

In a similar findings, Akyol et al. (2014) suggest that strong securities regulation improves transparency and the quality of financial reporting. Similarly, El-wassal (2013) argue that compulsory disclosure of reliable information increases investor participation and trading in stock markets. Consequently, the financial market attracts more investment opportunities when investors are confident with the existing regulation which can impose stiff legal penalties for misreporting. La Porta, Lopez-de-silanes, and Shleifer (2006) contend that, for a financial market to succeed, it should not be left to market forces alone.

Moreover, the slow recovery of the African stock markets from the 2008 GFC can be ascribed to poor market regulations that instill fear in investors with little protection. It is worthy of mentioning that the existing securities market laws in Africa are not strong enough to guard the market against future eventualities and fraud. The policy implication is similar to the studies of Teall (2018) and (Yildiz et al., 2017) that conclude regulation of securities market reduces distortion and market collapse through an up-to-date decision and taking corrective measures. The authors further stressed that leaving a financial market less-regulated affects market credibility, competition and efficiency leading to investors' withdrawal from the respective market. Hence, the nation's financial strength can be partly attributed to the public willingness to entrust financial assets to markets. In fact, numerous financial products owe their existence to strong regulatory enforcement. Therefore, the findings of this study point to the importance of security market regulation to ensure a stable and sustainable stock market development.

The findings of the second objective reveal that banks and stock markets are negatively related in Africa. The reason for this negative relationship may be due to the dominance of the banking system with little contribution of stock market to the continents' financial system. However, the substitutability of banks and stock markets may not promote sustainable growth as most of the advanced economies have a complementary relationship between the two institutions. Nevertheless, Ho (2017) and Cheng (2012) found a similar negative relationship in their studies for Malaysia and Taiwan respectively. The aforementioned studies argue that substitutability may bring unhealthy competition leading to a collapse of either of the two segments.

In contrast, when banks are complementary to stock markets, it may lead to their expansion and economic development. In fact, the 2008 GFC uncovers the importance of stock market and bank interaction. In a related study, Arestis, Demetriades, and Luintel (2001) argue that firms reduce their demand for bank loans when shares are issued to the public as alternative source of financing their business. The diversification of African financial system can propel development of stock markets and reduce the burden on the banking sector in providing efficient financial services to customers. In addition, Arize et al. (2018) reinstate the need for policies that can balance the banks and stock markets involvement in financial service delivery to customers to promote their performance.

The third hypothesis test reveal that life expectancy and stock markets are positively related. The implication is that investors additional years of living can induce them to increase investment by diverting part of their income to long-term investment. Apart

from using current income, other households can utilize their retirement benefit for future investment when they live a longer lifetime. Therefore, a rise in life expectancy can enhance the welfare of workers and improve their productivity. In another recent investigation, Alda (2017) asserts that population aging is a critical demographic shift that may have effect on stock markets as people make more savings for long-term investment.

The finding of this study is similar suggestions of Kunze (2014) and Ecevit (2013) on how life expectancy promotes economic growth. They argue that a rising standard of living and access to quality health services can partly contribute to longevity which translates to economic growth. It further emphasizes the relevance of public health investment to human capital development. Similarly, Goyal (2004) finding supports the traditional life cycle investment model that predicts a positive link between age and investment. Therefore, savings and investment in stock market can go a long way at improving workers' future benefit after retirement as their accumulated assets can be converted to spendable income. However, there is a need for policies and resilient financial institutions to protect future investment against the adverse effect of inflation and asset price volatility.

The fourth hypothesis also reveals a positive relationship between poverty reduction and stock market development. The positive link can be interpreted that, as poverty is drastically reduced, Africans could have more spendable income to make a long-term investment. Furthermore, Ojeaga (2014) reports that Africa has the highest population living below poverty line and effort should be made to provide opportunities to the

poor to cater for their family needs. Similarly, Imai et al. (2017) document that over 60% of the African population are below the age of 25. Consequently, the increasing population without corresponding opportunities can aggravate the level of poverty in the region. It is intuitive to predict that special intervention programs in agricultural and industrial sectors, rural infrastructure, increased access to financial services and human capital development can be important drivers of poverty reduction in the African region.

Although the existing literature has overlooked the poverty reduction-stock market nexus, the policy implication is related to the findings of Imai et al. (2017); Boukhatem (2016) and Demirgüç-Kunt and Levine (2009) that examine the effect of financial development on poverty reduction. Their findings suggest that financial development benefit the poor through increasing access to various sources of finance which facilitates their consumption smoothing and human capital investment. Therefore, attaining a high-income level through poverty reduction/alleviation programs promotes savings and investment in stock markets.

The fifth hypothesis reveals a positive link between unemployment and stock market development. This can be interpreted that the unemployment can cause increase in stock prices though the announcement can be good news for equity markets. Consistent with the previous literature, the movement of equity prices due to unemployment rate indicates how investors respond to macroeconomic forces through their trading. In similar studies, Birz and Dutta (2016) and Lahaye et al. (2011) document that unemployment is among the most critical factors affecting stock prices.

This indicates that future expectations are reflected in stock prices and their movement is attributed to a reaction of monetary authorities to combat unemployment. Thus, Boyd et al. (2005) and Mustafa et al. (2015) in their separate studies report similar implications regarding the unemployment-stock market nexus.

Therefore, the release of unemployment news allows monetary authorities to cut down interest rate to induce borrowing and promote economic expansion with more access to finance for investment. However, investors withdraw their capital when the rate is adjusted upward, and this could affect stock prices negatively. A surprise easing of monetary policy due to unemployment lowers risk premium and increases stock prices while a tight policy raises equity risk premium and lowers their price (Bernanke & Kuttner, 2005). Needless to say, however, the nature of stock market reaction to unemployment announcement reveals market expectation regarding economic expansion or contraction.

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The last hypothesis test shows that export growth and stock market development have a positive and statistically significant relationship. This finding reveals the benefit of export to firms and the entire economy. In other words, a rise in export brings in more foreign resources and enhances balance of payment. Therefore, to improve a trade-related development for Africa, an inclusive approach is needed to harness the abundant untapped natural resources. Sheridan (2014) asserts that development is multifaceted that cut across areas including education, investment and trade. Despite a global trade expansion, the export performance of the African economies has been discouraging and is more of raw material export.

Consequently, the region could not produce to its domestic demand leading to more importation to the detriment of the infant industries. Hence, taking proactive measures becomes crucial to improve export and expand the domestic investment on the African continent. This can assist the region against any form of future foreign divestment due to financial crisis or economic instability. The policy implication is however similar to Seraphin and Yinguo (2015) and Yee (2016) studies that show export diversification can improve firms' performance and economic growth especially for countries at their early stage of development. Similarly, they stressed the need for a policy framework that encourages export of non-traditional product and promotes technological innovation in the manufacturing and agricultural sectors.

Additionally, it is worth to mention that the control variables of exchange rates and interest rate exert significant predictive power on stock market development. This is an indication of the effectiveness of monetary policy tools in pricing stock market. To put it differently, the monetary policy transmission mechanism to the real sector is felt through stock markets. Therefore, stock market can be described as forward looking and a reflection of the economic strength of nations. The policy implication of these findings is that investors should pay attention to any information from monetary policy authorities as it will have a greater impact on stock market development. It also discloses that stock market responds swiftly to policy framework from monetary authorities. The policy implication is consistent with the findings of Koulakiotis et al. (2015) and Amarasinghe (2015) for exchange rates and interest rates respectively.

5.4 Limitations of the Study

As reported in previous literature, this study is also constrained with some limitations as it uses annual data for 12 out of 54 African countries due to data availability. The result may not be generalized to other stock markets that are not included. Moreover, this study uses the first-generation panel unit root test to check for data stationarity though the test does not account for a presence of cross-sectional dependency. The cross-sectional dependency occurs due to factors including but not limited to technology spillovers and global financial crisis.

This problem can only be checked using a second-generation panel unit root. In addition, the present study is limited to few data sources including the World Development Indicators, World Governance Indicators as well as the Financial Institutions and Structure database because the other sources are not available or could not be assessed.

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5.5 Recommendations for Future Research

The study addresses part of the identified shortcomings from the previous literature in terms of scope and methodology. Nevertheless, some challenges are still unresolved and can only be overcome by future studies. First, the lack of adequate data did not allow for the inclusion of more African countries using higher frequency data as the region is currently having 27 stock exchanges but only 12 are considered. The future research should include more countries to justify generalization of findings. Similarly, future studies should expand the sources of data to include more reliable sources which can be used to check for robustness of the main findings.

The second recommendation relates to methodology as this study uses first generation panel unit root of Im et al. (2003) to check for stationarity of data. This test did not check for cross sectional dependency. Therefore, future literature with enough data can check for the possible existence of contemporaneous correlation using the second-generation unit root test. For example, the Pesaran (2004) cross-section dependency test overcomes the deficiency of the first generation unit root tests.

Moreover, when the future studies uncover presence of cross-sectional dependency problem, the pooled mean group model cannot eliminate the problem. As a remedy, the future research should use the dynamic common correlation effect pool (CCEP) recently developed by Chudik and Pesaran (2015) to eliminate the cross-section dependency problem in both the short and long-run estimates. The dynamic model of CCEP is very efficient in the presence of unobserved common effects (Pesaran, 2006). However, Chudik and Pesaran (2015) state that the CCEP model is only appropriate for studies having more cross section over time. In other words, the number of countries should be more than time thus cannot be appropriate for this study that has more time than countries.

5.6 Contributions of the Study

This study made several contributions with respect to improving the African stock market development to compete with other stock exchanges globally. The contributions are classified into practical, theoretical and methodological contributions to the existing stock market literature.

5.6.1 Practical Contribution

The poor regulation of the African stock markets subjected investors and other market participants into several risks resulting into low patronage and decline of sentiment. The findings of this study may serve as a rich source of information to enhance the existing securities regulation and promote market development. This includes giving the Securities and Exchange Commission (SEC) of the African countries complete independence to regulate the investment environment and formulate policies that attract domestic and foreign diversification to the region. This study also highlights the need for a concerted effort from the appropriate authorities to promote the stock market-banking relationship to become strong complementary institutions to promote financial system of the region.

5.6.2 Theoretical Contributions

The previous studies examine the general macroeconomic determinants of stock market development in Africa (Nyasha & Odhiambo, 2015; Umer et al., 2015; Addo & Sunzuoye, 2013; Laichena & Obwogi, 2015). There is little panel evidence using poverty reduction, life expectancy, unemployment, banking development, regulatory quality and the export growth to see how they predict stock market development in Africa. This study is able to bring new evidence and contributed to filling the existing literature gap.

The negative interaction between the banking and stock market development is an important contribution to the Stiglitz (1985) banks-stock market substitutability model. This model sees banks and stock markets as alternative investment vehicles.

In other words, when banks dominate the financial system of a particular nation, it will lead to a slowdown of stock market activities. Secondly, the findings of positive link between life expectancy and stock market development is a key contribution to the Arbitrage Pricing Theory (APT) and Modigliani and Brumberg (1954) life circle investment model. The life-circle model predicts a positive impact of a demographic change to the capital market returns. It is worth noting that this relationship was not examined previously in Africa as most of the previous literature is on the interaction between life expectancy and economic growth (Ecevit, 2013; Hami, 2016; Kinugasa et al. 2010).

Moreover, the positive link between unemployment and stock market development found in this study is a contribution to the Blanchard (1981) extended IS-LM model of asset prices. The model shows that interaction between output and stock market depends on the prevailing economic condition of a nation. The inadequate African panel studies provide this study an additional impetus to empirically examine how unemployment predicts stock market development. The findings of this hypothesis have also added a new knowledge gap to the Ross (1976) Arbitrage Pricing model that states economic forces predict stock market returns.

Another theoretical contribution of this study is the positive nexus between poverty reduction and the stock market development. The existing empirical studies on the poverty reduction-stock market nexus are inadequate thus represents a salient contribution to the Arbitrage pricing model. The increasing poverty level raises a question of how household generates income to make further investment in financial

markets. Thus, poverty reduction policies are highly needed in Africa to promote long-term investment. Additionally, the findings of the positive link between export growth and stock market development contribute to the Arbitrage Pricing Model where the African stock market development depends partly on the growth of export by the domestic firms.

5.6.3 Methodological Contribution

In contrast to the methodologies employed in the previous literature, this study is one of the few studies (Fromentin, 2016; Jouini, 2014; Kim et al., 2010) that used the pooled mean group (PMG) model to estimate the long-run relationship. The PMG/Panel autoregressive distributed lag model is the most appropriate model as it addresses the problem of longer time fewer cross-sections. Hence, this study investigates the impact of regulation, banking development and economic forces on the stock market development in the selected African countries. The application of PMG is the methodological contribution to the long-run estimation of the stock market development.

Secondly, the previous studies utilize a single measure of stock market which did not capture an entire development of the market. This study constructed a composite index that incorporates market capitalization, turnover and the stock traded value representing the major indicators of market development (Levine & Zervos 1996).

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5.7 Conclusions

Consistent with previous literature and in line with the Arbitrage Pricing Theory, the present study investigates the predictors of stock market development in the twelve (12) African countries. The APT (modern financial theory) helps in shedding light on the sensitivity of stock market with regard to several risk factors. There can be several reasons explaining the linking behavior of stock market to legal, financial and economic variables. Similarly, researchers are keen to investigate whether information on the movement of multiple risk factor reflects the current level of the African stock market development. It is worth noting that empirical evidence on the presence of significant nexus between stock market and its explanatory series could be a useful guide for investors and policymakers.

This study examines the impact of regulations, banking development and selected economic forces on the stock market development using data from 1996 to 2016. The Arbitrage Pricing Theory (APT) is the underpinning theory of the present study while the long-run pooled mean group (PMG) estimates support the three objectives of the study. In his model, Stigler (1964) states that securities market regulation was enacted to sanitize the financial market, increase the portion of truth and avert possibilities of market irregularities. The positive nexus between regulation and stock market development is in line with the findings of Bagnoli et al (2008) and Eng et al. (2013). These studies conclude that financial market regulation increase trading volume and equity returns. In fact, investors' confidence in a particular market is a function of how existing securities protect and discipline fraudulent activities. In view of this, a strong regulatory framework can be a confidence builder to investment in stock market.

In addition, the model states that banks and stock markets are two alternative vehicles for financial system development. Stiglitz further argues that the development of one can impede the other. The negative relationship between the variables found in this study agrees with the findings of Ho (2017). This indicates that, to consolidate the developing economies financial system, there is a need for a complementary service between banks and the stock markets. Needless to say, however, the countries with a well-developed financial institution can also have strong stock markets. This calls for a policy framework in Africa and effective collaboration between the banks and the stock market to promote sustainable development. This supports the assertion of El-Wassal (2013) that stock market cannot be developed without a strong and balanced financial system.

Moreover, the positive relation between the life expectancy and stock market development corroborates with the Modigliani and Brumberg (1954) life circle investment model. This shows that demographic change predicts capital market returns. To be more specific, the working population invest more in stock markets as they grow older. Although studies on this direct relationship are not adequate, the findings of this study are related to the Hami (2016) and Ecevit (2013) studies that suggest a positive relationship between life expectancy and economic growth. Hence, the knowledge on how stock market reacts to life expectancy will help in making a future long-term investment decision. Based on our findings, it can be concluded that the attention of policymakers should focus on the improvement of quality health care and medical services to reduce mortality rate and boost workers' confidence of to make investment in the African stock markets.

On the other hand, poverty is risk factor impeding households to save and make long term investment. Therefore, poverty reduction will increase household's income and can promote their savings and investment culture. However, Ojeaga (2014) reports that the African region is the worst affected with most of the population in abject poverty. In a related study, Beck et al. (2004) assert that countries having developed financial market are also experiencing a speedy poverty reduction. It could be argued that when households' poverty is reduced to a minimum level, they will be able to save and invest in stock markets.

Despite contradictions on the relationship between unemployment and stock markets, the Blanchard (1981) extended IS-LM model disclose that the direction between stock market-unemployment nexus is subject to prevailing economic condition. The unemployment rate under economic prosperity can positively affect stock markets while in the recession period, announcement of unemployment can adversely affect stock markets. This study suggests a positive relationship between the variables in line with some empirical literature (Fritsche & Pierzio 2016; Holmes & Magrebi, 2016). Similarly, Birz and Dutta (2016) posit that unemployment is one of the most crucial announcements affecting equity markets. Based on the findings of this hypothesis, it can be concluded that unemployment is an important predictor of stock market development.

Therefore, attention should be given to unemployment as it is a useful tool in forecasting stock markets. It can be concluded that unemployment is a closely monitored indicator of economic activity by both policymakers and investors. The

reason for close monitoring is not farfetched as unemployment is linked to a lower psychological wellbeing (Horvath & Zhong, 2019). It also seems that unemployment possesses a superior predictive strength on stock market development. Hence, it is reasonable to deduce that investors respond more intensively to information regarding economic forces compared to other factors. Needless to say, the past values of economic forces are useful in predicting changes in stock market while decline in confidence can cause market to shift from low to high level of unemployment. Celebi and Honig (2019) reveals that stock markets react more to movement of economic forces in crisis period compared to pre-crisis response. It is obvious that investors pay more attention to trend in macroeconomic environment during financial crisis period.

Since global economies are inter-dependent, emphasis should be given on the need for cross-country or export trade. This study found that export growth exerts a positive impact on the stock market development in line with the Regolo (2017) findings. The results are also lent support to the Arbitrage Pricing Theory which show the predictive power of economic variables on stock market development. Conclusively, an inclusive approach is necessary to harness the abundant natural resources in the African region. Specifically, the firm's diversification to the untapped natural resources can increase their export horizon and equity returns in the long run. It implies that decline and fluctuation of export can cause a sharp decline of firms cashflows and profitability both are prerequisite for stock market development.

Moreover, the control variables of exchange rate, interest rate and financial crisis play a significant role in explaining the African stock market development. To strengthen

the empirical findings, this study includes the control variables as they may carry useful information that are not explained by the independent variables. It was stated that arrival of information usually tells investors whether or not to adjust price of their stocks (Lyócsa, Molnár, & Plíhal, 2019). Therefore, investors evaluate valuable information to formulate their expectation about future returns. In a related study, Magombeyi and Odhiambo (2018) suggest that a stock price movement reflects market reaction to any information influencing investors perception.

To be more specific, interest rate is found to be an important monetary policy tool for maintaining economic and financial stability. In a related study, Padamou et al. (2016) suggest that investors decision is mostly based on economic variables that are affected by the monetary policy decision. It is worthy of noting that interest rate is the most promising among all the variables of this study in predicting stock market development. Moreover, investors are mindful of any decision taken by monetary authorities while high interest rate can prevent/discourage borrowing and long-term investment. For example, a contractionary monetary policy results to high interest rates with a potential of reducing cashflows and future value of stocks. This policy can result to divestment from equity market. On the contrary, an expansionary monetary policy lowers interest rate which has the potential of inducing borrowing, investment and further expansion of economic activities including rise of stock prices.

In a related study, Sidek and Abdulrahman (2011) also provided evidence that a restrictive monetary policy with higher interest rates/discount rates reduce the value of cashflows. Consequently, it reduces investment attractiveness which could shrink

the value of stock price. This implies that, local factors (lending rates) are more effective to emerging economies that are segmented from the global market in causing stock market movement. It becomes indispensable to note that the emphasis of inflation-targeting monetary policy is mainly on managing inflation expectation in order to stabilize interest rate which is essential for economic and financial stability. Hence the findings highlight the need for lower lending rate to induce investment and expansion of economic activities.

Similarly, the present study found exchange has a positive and statistically significant impact in predicting stock market development. This finding is in line with the Mishra (2004) conclusion that both exchange rate and stock market are sensitive segments of financial market with a speedy reflection of policy change. Hence, a monetary policy transmission mechanism of exchange rate continues to be impactful on investors decision and stock price movement. The future dividend however contains information relating to economic fundamentals. Nevertheless, exchange rate volatility may cause change in future investment decision as foreign investors are unwilling to invest in a highly depreciated currency. In other words, exchange rate stability can help firms to realize their future expected cashflows and market returns as shocks in currency market reflects unstable economic forces.

In addition, since future corporate earnings reflect the strength of economic forces, the information about exchange rate would pave way in formulating policies to insure financial and economic stability of nations. In view of this, the African investors should take into cognizance the exchange rate movement when formulating their

portfolio diversification strategies. Shanken and Weinstein (2006) asserts that financial market participants place emphasis on forces predicting the price of securities. Similarly, Chinzara (2011) disclose that future returns and dividend are related to the behavior of economic forces. Consistent with the previous studies, the present study concludes that stock market participants are keen observers of trend in economic fundamentals as the knowledge assist them in optimizing their portfolios.

On the other hand, the increasing level of financial integration has resulted to a shock in one country to cause crisis in other countries. In the same vein, investors diversify their portfolio to other countries as an investment strategy of mitigating risk. The findings of this study reveal that the 2008 global financial crisis has a devastating effect on the African stock market development. This justifies the growing interest in international portfolio diversification to hedge against risk in stock market investment. The negative effect of the financial crisis calls for a holistic approach in dealing with future financial crisis in Africa. The findings lend support to Aluko, Fapetu and Azeez (2018) that suggest liberalized stock markets create opportunity for investors to exploit international portfolio diversification. In a related study, Zhou (2019) reveals that household stock ownership decline significantly during the global financial crisis. This implies that financial crisis results to confidence erosion from stock market investment and selloff of financial securities.

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Appendix A

Stock Market Capitalization Ratio of listed domestic companies

Year	Cote devoir	Egypt	Ghana	Kenya	Malawi	Mauritius	Morocco	Namibia	Nigeria	South Africa	Uganda	Zambia
1996	7.303	16.434	20.072	14.878	-10.81	33.576	20.029	12.00	7.853	166.988	0.346	2.882
1997	8.936	22.295	17.842	14.024	-8.91	37.302	29.977	16.8	10.087	155.436	0.401	10.877
1998	12.338	26.781	16.714	13.776	-7.01	39.890	34.794	11.17	9.892	136.666	0.454	12.981
1999	13.166	31.489	14.313	12.595	-5.11	39.926	36.381	17.46	8.339	156.134	0.508	8.356
2000	12.147	30.869	9.802	10.345	-3.21	31.718	31.906	7.75	7.532	165.996	0.562	7.134
2001	11.146	26.135	8.815	8.904	-1.31	24.983	25.419	4.24	10.018	129.998	0.616	6.242
2002	11.107	26.649	9.856	9.326	0.59	24.911	22.247	4.392	9.351	134.861	0.670	5.923
2003	11.954	29.709	14.317	19.227	2.49	30.084	23.072	5.574	10.711	157.945	0.724	10.601
2004	12.639	38.831	22.905	25.282	4.39	34.151	34.534	6.158	13.151	175.844	0.874	11.308
2005	13.609	66.063	21.251	27.954	6.29	38.618	43.861	5.952	15.813	209.403	1.156	10.204
2006	18.881	82.063	12.030	41.08	14.68	46.537	58.555	5.826	18.446	238.914	1.091	11.135
2007	32.881	88.739	11.441	46.970	23.975	59.222	85.191	6.938	35.991	265.619	11.355	14.674
2008	35.188	76.195	9.676	42.327	33.27	51.700	82.511	7.014	35.548	227.075	21.62	15.774
2009	27.806	47.206	10.151	33.583	22.32	44.287	69.560	8.237	21.736	210.071	20.684	16.873
2010	28.072	39.682	9.481	38.412	19.59	62.953	71.844	9.854	19.545	200.978	15.285	17.972
2011	28.850	27.481	8.441	35.347	17.33	69.750	66.386	9.588	17.303	145.229	26.201	17.740
2012	33.325	21.41	7.401	32.281	12.59	61.53	53.4	9.322	12.19	229.02	37.118	17.508
2013	37.8	21.54	6.361	29.216	7.85	73.72	50.39	9.056	15.65	256.48	48.035	17.277
2014	34.22	23.24	5.321	26.151	3.11	68.34	48.0	8.790	11.16	265.84	58.951	17.045
2015	39.33	16.68	4.281	23.086	-1.63	61.96	45.65	8.524	10.38	233.95	69.868	16.813
2016	44.44	10.12	3.241	20.021	-6.37	55.58	43.3	8.258	9.6	202.06	80.785	16.581

Appendix B

Domestic Credit to Private Sector by Banks (% of GDP)

Year	Cote divoire	Egypt	Ghana	Kenya	Malawi	Mauritius	Morocco	Namibia	Nigeria	South Africa	Uganda	Zambia
1996	16.36122	36.53439	6.005079	21.51429	4.028828	43.40375	24.0689	41.36313	8.978994	59.95689	5.278934	8.0606
1997	16.77027	39.69361	8.195094	24.21845	3.661004	49.09835	40.54118	42.0844	10.66127	61.85087	4.823475	6.8248
1998	15.94884	46.55501	9.203715	23.81171	6.395414	56.40879	41.7415	41.37627	12.98141	66.4524	5.611753	5.9620
1999	14.23208	52.00182	12.40541	26.41728	4.747461	57.12808	44.96358	39.57562	13.49416	66.26619	6.020243	6.4216
2000	14.89028	51.95328	13.81501	25.61514	5.603748	57.49743	48.33552	39.7845	12.30446	67.3355	5.674234	7.3702
2001	12.02677	54.93114	11.74587	25.0709	5.207935	57.81885	42.3585	41.31075	16.50936	74.43265	6.622314	6.3597
2002	11.84028	54.6554	12.00124	25.70175	2.746888	58.59116	41.28025	40.82206	13.02111	56.03039	7.702312	5.2985
2003	10.18648	53.89763	12.38701	24.99471	3.13701	73.1932	40.46242	44.27078	13.79619	60.77205	8.270646	5.8506
2004	10.87921	54.04292	13.05804	27.13177	3.678725	72.98623	40.57228	46.15722	13.12077	62.50478	7.612968	6.9312
2005	9.680267	51.16544	15.42956	26.13132	4.0427	75.1778	43.93874	50.72686	13.22053	65.90211	8.471885	6.5290
2006	11.55638	49.29098	11.01962	22.76716	5.102492	68.60234	46.39777	48.19857	13.16818	73.62445	9.970364	8.0804
2007	14.50794	45.51522	14.41774	22.93319	5.478204	71.67468	55.4592	48.23149	24.57161	78.29414	10.09833	9.6248
2008	14.69264	42.79751	15.82746	25.28172	9.113463	81.76213	60.60358	46.56347	33.65413	76.68678	13.78591	12.173
2009	15.64138	36.09271	15.54375	24.92966	10.87478	80.04582	63.20458	47.9828	38.34855	74.59646	9.720509	9.9534
2010	16.32321	33.0723	14.58034	27.13387	13.82962	85.2779	66.74277	47.97483	15.3907	70.35181	13.2819	9.1480
2011	16.83289	31.15492	14.3848	30.42144	13.93239	89.2581	70.32613	48.5398	12.46493	67.5855	15.1432	10.011
2012	16.39031	27.38845	14.73673	29.48282	14.57426	98.79949	71.54543	48.47009	11.78871	68.62892	13.41167	11.933
2013	17.99473	26.22244	16.07318	31.63273	12.45304	106.2603	68.1081	47.84597	12.58533	67.27483	13.31045	11.641
2014	19.14975	25.60668	18.83815	34.06767	11.40364	98.73223	68.34647	49.63639	14.48775	67.01888	13.80338	13.330
2015	22.21025	26.31639	19.36758	34.61821	12.25859	102.768	64.22295	53.75913	14.19323	68.24127	14.32514	15.677
2016	22.70222	49.44033	19.897	34.62449	10.51072	96.36594	65.60282	57.88187	15.64045	78.48761	13.6654	12.925

Appendix C

Regulatory Quality Index

Year	Cote Devoir	Egypt	Ghana	Kenya	Malawi	Mauritius	Morocco	Namibia	Nigeria	South Africa	Uganda	Zambia
1996	-0.47506	0.009786	-0.38289	-0.37436	-0.2907	-0.02088	-0.17364	0.38104	-0.8171	0.3374	0.20793	-0.4218
1998	-0.26287	-0.33566	-0.24588	-0.34502	-0.2276	0.396877	-0.06078	0.16146	-0.9253	0.2671	0.24962	-0.1172
2000	-0.54458	-0.35037	-0.1026	-0.29987	-0.2201	0.584709	-0.05529	0.26845	-0.7434	0.4023	0.07895	-0.2593
2002	-0.44704	-0.49709	-0.4702	-0.17132	-0.5065	0.551486	-0.15843	0.49924	-1.2265	0.6299	-0.0318	-0.6129
2003	-0.81929	-0.61912	-0.282	-0.26423	-0.4592	0.579501	-0.26998	0.22116	-1.2402	0.7783	-0.0045	-0.5430
2004	-0.95719	-0.4925	-0.34966	-0.26233	-0.5218	0.422326	-0.23384	0.16498	-1.3228	0.6629	0.00410	-0.5136
2005	-0.95532	-0.41316	-0.10727	-0.23298	-0.4743	0.437491	-0.40382	0.12453	-0.7659	0.6700	-0.1782	-0.6965
2006	-0.90895	-0.43305	-0.07156	-0.1701	-0.5020	0.559843	-0.17059	0.12090	-0.8933	0.6784	-0.2145	-0.6206
2007	-0.84429	-0.28226	-0.04669	-0.23023	-0.4495	0.527652	-0.19973	-0.0282	-0.8714	0.4978	-0.2046	-0.4868
2008	-0.88815	-0.17432	-0.03091	-0.20073	-0.4768	0.798839	-0.17925	0.16752	-0.7807	0.4975	-0.2120	-0.4519
2009	-0.95009	-0.18704	0.09056	-0.13337	-0.4418	0.870435	-0.048	0.10326	-0.7282	0.3998	-0.1491	-0.5022
2010	-0.91198	-0.15662	0.12555	-0.07323	-0.5745	0.90115	-0.06731	0.08386	-0.7143	0.3585	-0.1531	-0.4781
2011	-0.85766	-0.3253	0.13206	-0.20681	-0.7005	0.850552	-0.10482	0.04459	-0.6685	0.4025	-0.1398	-0.4203
2012	-0.75637	-0.47063	0.12988	-0.29418	-0.7006	0.996537	-0.07734	0.07558	-0.7074	0.3839	-0.2305	-0.4137
2013	-0.72967	-0.63839	0.08430	-0.29701	-0.6812	0.942605	-0.11424	0.08611	-0.6566	0.4233	-0.2381	-0.4667
2014	-0.58242	-0.74168	-0.00718	-0.30963	-0.7818	1.123364	-0.12418	-0.0094	-0.8120	0.3012	-0.2021	-0.4918
2015	-0.51524	-0.7965	-0.03089	-0.29427	-0.8188	1.088608	-0.17242	-0.0822	-0.8406	0.3035	-0.2420	-0.4223
2016	-0.44807	-0.85131	-0.05461	-0.27891	-0.8558	1.053852	-0.22066	-0.1551	-0.8692	0.3059	-0.2819	-0.3528

Appendix D

Life Expectancy at birth, total (Years)

Year	Cote Devoir	Egypt	Ghana	Kenya	Malawi	Mauritius	Morocco	Namibia	Nigeria	South Africa	Uganda	Zambia
1996	48.7902	57.34078	53.2151	46.5129	70.3229	67.1181	59.3380	45.8770	60.5344	71.985	44.452	67.232
1997	48.0750	57.16425	52.5950	46.4355	70.4048	67.4579	58.4264	45.9212	59.6211	72.352	44.832	67.664
1998	47.4640	57.02393	52.1077	46.3687	70.6073	67.8198	57.4498	45.9924	58.5854	72.683	45.402	68.036
1999	46.9925	56.95371	51.8010	46.3505	70.9609	68.2142	56.4668	46.1000	57.4827	72.983	46.148	68.343
2000	46.6974	56.9851	51.7409	46.4363	71.6634	68.6521	55.5421	46.2644	56.3683	73.253	47.051	68.588
2001	46.5973	57.13861	51.9878	46.6843	71.7658	69.1402	54.7321	46.5057	55.2946	73.499	48.080	68.783
2002	46.6725	57.39993	52.5427	47.1303	71.9658	69.6701	54.0798	46.8299	54.3149	73.721	49.190	68.948
2003	46.8942	57.75015	53.3845	47.7912	72.1213	70.2297	53.6257	47.2346	53.4904	73.923	50.333	69.104
2004	47.2445	58.17534	54.4789	48.6712	72.2767	70.8085	53.4107	47.7107	52.8803	74.106	51.469	69.260
2005	47.6964	58.65202	55.7802	49.7715	72.4322	71.3928	53.4888	48.2383	52.5631	74.272	52.566	69.424
2006	48.2188	59.15122	57.2279	51.08	72.4322	71.9678	53.9024	48.7928	52.6046	74.415	53.603	69.598
2007	48.7802	59.64388	58.7390	52.5392	72.5707	72.5202	54.6246	49.3462	52.9970	74.535	54.581	69.779
2008	49.3514	60.10603	60.2285	54.0801	72.5707	73.0381	55.6013	49.8775	53.7040	74.636	55.495	69.963
2009	49.9113	60.52364	61.6316	55.6427	72.8824	73.5134	56.7777	50.3757	54.6834	74.725	56.332	70.150
2010	50.4507	60.89373	62.8881	57.1562	72.9673	73.9410	58.0746	50.8372	55.8696	74.811	57.077	70.341
2011	50.9723	61.22078	63.9605	58.5573	73.2668	74.3202	59.4039	51.2696	57.1810	74.906	57.722	70.534
2012	51.4901	61.52432	64.8599	59.8147	73.8634	74.6606	60.6847	51.6904	58.5204	75.018	58.274	70.728
2013	52.0160	61.82032	65.6030	60.9064	74.0170	74.9701	61.8454	52.1127	59.8000	75.154	58.749	70.920
2014	52.5470	62.11378	66.1941	61.8166	74.1943	75.2551	62.8389	52.5413	60.9547	75.314	59.155	71.109
2015	53.0782	62.40725	66.6456	62.5433	74.3531	75.5201	63.6364	52.9779	61.9341	75.497	59.508	71.295
2016	53.6094	62.70071	67.0971	63.2701	74.5119	75.7851	64.4339	53.4145	62.9134	75.679	54.723	71.481

Appendix E

Household Final Consumption Expenditure Per Capita

Year	Cote Devoir	Egypt	Ghana	Kenya	Malawi	Mauritius	Morocco	Namibia	Nigeria	South Africa	Uganda	Zambia
1996	647.734	1394.823	712.7222	649.2481	258.215	3275.779	1211.043	2182.27	1133.31	3207.32	316.05	575.66
1997	659.475	1426.404	735.4326	655.2836	267.709	3399.85	1144.922	2275.19	1067.16	3256.91	314.52	550.82
1998	671.215	1431.771	758.1429	666.5038	277.203	3571.559	1195.723	2291.32	1048.22	3263.3	326.02	525.99
1999	682.955	1470.858	780.8532	674.991	286.696	3669.736	1201.176	2262.88	960.90	3271.24	340.58	501.15
2000	694.696	1518.439	803.5635	654.231	296.190	3770.248	1208.575	2342.19	954.36	3356.29	336.24	476.32
2001	706.436	1549.618	826.2739	663.0052	305.684	3860.603	1208.455	2507.68	1316.33	3441.64	332.65	451.48
2002	718.176	1553.277	848.9842	650.6299	315.178	3959.988	1235.865	2435.02	1291.45	3508.82	348.17	426.65
2003	729.917	1560.049	871.6945	647.0987	324.671	4128.554	1294.618	2604.90	1452.53	3564.43	348.44	401.81
2004	741.657	1563.295	894.4048	644.9193	334.779	4420.649	1336.394	2624.45	1526.13	3739.85	344.76	376.98
2005	753.398	1608.776	917.1152	668.0827	337.600	4714.621	1364.667	2615.26	1624.11	3918.80	351.21	447.28
2006	765.138	1681.006	939.8255	714.494	334.542	5079.94	1436.424	2810.17	1285.68	4207.30	381.17	517.58
2007	776.878	1765.521	962.5358	731.9098	301.120	5282.483	1484.754	2825.50	1723.75	4421.93	402.89	587.88
2008	788.619	1833.733	1039.406	701.2294	323.046	5616.523	1577.914	3146.76	1353.54	4414.64	393.64	658.19
2009	800.359	1901.546	992.6391	713.5637	312.085	5718.718	1621.297	3532.93	1736.00	4240.52	451.61	728.49
2010	818.201	1940.752	1022.328	746.357	345.192	5855.535	1665.36	3282.14	1538.84	4344.80	454.11	798.79
2011	752.986	2005.417	1142.091	771.9947	378.727	5992.588	1732.939	3504.97	1452.44	4502.01	465.43	760.45
2012	818.731	2088.933	994.7311	794.7396	416.127	6139.785	1779.171	3759.35	1414.14	4599.56	486.85	722.11
2013	831.411	2110.699	1068.631	838.296	364.772	6287.897	1809.025	4021.37	1666.88	4620.40	470.71	683.77
2014	893.403	2155.358	1101.627	851.3383	393.008	6441.595	1846.764	4198.78	1633.09	4580.97	466.41	645.42
2015	990.703	2175.301	1049.779	871.5258	409.107	6617.793	1865.157	4587.57	1612.73	4584.36	501.62	607.08
2016	1059.86	2229.585	997.9319	889.835	477.211	6811.644	1887.684	4794.56	1592.37	4548.42	484.55	568.74

Appendix F

Unemployment rates

Year	Cote Devoir	Egypt	Ghana	Kenya	Malawi	Mauritius	Morocco	Namibia	Nigeria	South Africa	Uganda	Zambia
1996	9.312	9.00	8.507	9.989	6.916	5.8	18.1	19.53	6.87	21.0	2.95	15.0
1997	9.279	8.4	7.709	10.355	6.87	6.6	16.9	19.5	4.62	22.9	1.74	13.52
1998	9.273	8.03	8.2	10.731	6.795	6.9	19.12	19.64	5.23	25.0	2.70	12.0
1999	9.214	7.95	10.1	8.1	7.336	7.7	13.94	19.76	5.92	25.4	2.60	12.47
2000	9.149	9	10.36	8.632	7.413	8.8	13.6	20.3	6.70	26.7	1.67	12.93
2001	9.182	9.26	7.573	9.188	7.489	6.8	12.46	35.31	6.77	26.2	2.17	13.71
2002	9.147	10.01	9.187	9.775	7.566	7.2	11.59	21.40	6.85	26.6	3.5	12.72
2003	9.152	11	6.481	10.39	7.644	7.7	11.92	20.45	6.93	27.14	3.2	15.47
2004	9.199	10.3	5.319	10.556	7.722	8.5	10.83	21.9	7.01	24.67	2.61	15.51
2005	9.212	11.2	4.933	10.717	7.8	9.6	11.01	23.12	7.05	23.84	1.9	15.9
2006	9.21	10.49	3.6	10.893	6.678	9.1	9.67	20.30	7.10	22.61	3.34	14.27
2007	9.217	8.8	9.43	11.068	6.589	8.5	9.8	21.0	7.14	22.53	2.78	12.11
2008	9.235	8.7	5.587	11.241	6.529	7.2	9.6	37.6	7.19	22.41	1.82	7.9
2009	9.252	9.38	8.431	12.17	6.512	7.3	9.1	29.71	7.23	23.52	2.81	8.64
2010	9.237	8.98	4.2	12.184	6.494	7.7	9.1	22.1	7.28	24.68	3.05	10.83
2011	9.139	12	3.983	12.068	6.473	7.9	8.91	24.68	7.33	24.64	3.37	13.62
2012	9.4	12.67	4.091	11.959	6.357	8.7	8.99	27.41	7.6	24.72	1.45	7.85
2013	9.394	13.21	5.2	11.894	6.44	7.62	9.23	29.65	7.1	24.56	1.91	7.75
2014	9.377	13.17	5.137	11.815	6.436	7.72	9.9	29.59	4.8	24.89	1.91	7.72
2015	9.34	12.84	5.537	11.29	6.637	7.92	9.7	26.93	4.27	25.15	2.14	7.62
2016	9.322	12.014	5.766	10.998	6.735	7.78	9.98	25.58	5.00	25.92	2.28	7.53

Appendix G

Export Growth (annual % growth)

Year	Cote Devoir	Egypt	Ghana	Kenya	Malawi	Mauritius	Morocco	Namibia	Nigeria	South Africa	Uganda	Zambia
1996	41.10	20.74	32.11	25.20	22.82	63.58	21.83	45.90	32.23	24.08	11.96	28.47
1997	42.91	18.84	32.41	22.68	21.35	61.46	23.92	43.18	41.77	23.98	13.35	27.37
1998	41.39	16.21	33.87	20.16	32.77	65.68	23.40	41.87	29.69	25.00	9.63	24.61
1999	42.40	15.05	32.07	20.83	28.02	63.93	25.15	41.96	33.86	24.69	12.25	25.03
2000	40.78	16.20	48.80	21.58	25.60	61.38	26.78	40.87	51.73	27.15	10.65	23.92
2001	40.70	17.47	45.23	22.93	27.99	68.45	28.20	41.17	45.44	29.37	11.51	25.10
2002	47.46	18.31	42.61	24.89	15.86	61.81	28.91	46.00	35.96	31.78	11.21	27.13
2003	41.89	21.79	40.67	24.08	20.17	56.67	27.50	43.38	39.78	26.88	11.38	25.68
2004	46.40	28.22	39.30	26.61	18.84	54.02	28.10	39.81	30.16	25.46	12.69	33.53
2005	49.89	30.34	36.44	28.50	18.12	59.85	30.91	40.44	31.65	26.44	14.17	30.61
2006	52.36	29.94	25.19	22.98	17.63	58.44	32.75	45.46	43.11	29.27	15.27	32.59
2007	47.22	30.24	24.52	21.91	23.31	55.86	34.57	50.48	33.72	31.17	16.72	33.59
2008	47.11	33.04	25.02	22.67	22.65	51.07	35.74	54.35	39.88	35.62	24.28	28.91
2009	50.85	24.95	29.29	20.03	20.02	47.67	28.00	52.34	30.76	27.91	17.26	29.25
2010	50.63	21.34	29.47	20.65	22.78	51.23	32.23	47.75	25.26	28.61	17.13	37.02
2011	53.81	20.56	36.93	21.62	20.77	52.44	34.70	45.52	31.32	30.46	19.01	40.47
2012	48.47	16.39	40.35	22.22	26.20	53.79	34.92	43.41	31.43	29.72	20.21	40.08
2013	41.53	17.01	34.18	19.92	35.65	48.41	32.77	41.18	18.04	30.88	20.29	40.48
2014	36.65	14.24	39.52	18.29	33.70	51.06	34.63	38.71	18.43	31.20	18.17	38.82
2015	37.71	13.18	43.85	16.65	29.32	48.79	34.79	39.04	10.63	30.37	18.44	37.13
2016	32.38	10.34	40.73	14.56	33.14	44.48	35.09	42.23	10.23	30.26	18.58	35.14

Appendix H

Exchange Rates (LCU/US$)

Year	Cote Devoir	Egypt	Ghana	Kenya	Malawi	Mauritius	Morocco	Namibia	Nigeria	South Africa	Uganda	Zambia
1996	523.69	3.38	0.17	55.02	15.32	17.97	8.79	4.68	21.88	4.68	1029.59	1.28
1997	598.80	3.38	0.22	62.67	21.22	22.26	9.71	4.86	21.88	4.86	1140.11	1.41
1998	562.20	3.39	0.23	61.90	43.88	24.78	9.25	5.86	21.88	5.86	1362.69	2.29
1999	652.95	3.40	0.35	72.93	46.43	25.46	10.08	6.15	97.95	6.15	1506.04	2.63
2000	704.95	3.69	0.70	78.03	80.07	27.88	10.61	7.56	109.55	7.56	1766.68	4.15
2001	744.30	4.49	0.73	78.60	67.29	30.39	11.56	12.12	112.95	12.12	1727.40	3.83
2002	625.49	4.50	0.84	77.07	87.13	29.19	10.16	8.64	126.40	8.64	1852.57	4.33
2003	519.36	6.15	0.88	76.13	108.56	26.08	8.74	6.64	136.50	6.64	1935.32	4.64
2004	481.57	6.13	0.90	77.34	108.94	28.20	8.21	5.63	132.35	5.63	1738.59	4.77
2005	556.03	5.73	0.91	72.36	123.78	30.66	9.24	6.32	129.00	6.32	1816.86	3.50
2006	498.06	5.70	0.92	69.39	139.34	34.33	8.45	6.97	128.27	6.97	1741.44	4.40
2007	445.59	5.50	0.97	62.67	140.31	28.21	7.71	6.81	117.96	6.81	1697.34	3.84
2008	471.33	5.50	1.21	77.71	140.59	31.75	8.09	9.30	132.56	9.30	1949.18	4.83
2009	455.33	5.47	1.41	75.82	145.99	30.29	7.86	7.38	149.58	7.38	1899.71	4.64
2010	490.91	5.79	1.47	80.75	150.80	30.39	8.35	6.63	150.66	6.63	2308.30	4.79
2011	506.96	6.01	1.55	85.06	163.75	29.32	8.57	8.14	158.26	8.14	2490.99	5.11
2012	497.16	6.30	1.88	86.00	335.12	30.52	8.43	8.50	157.32	8.50	2685.94	5.14
2013	475.64	6.94	2.21	86.30	434.95	30.079	8.15	10.48	157.25	10.48	2527.95	5.51
2014	540.28	7.14	3.19	90.50	470.77	31.72	9.04	11.58	169.68	11.58	2773.06	6.39
2015	602.51	7.80	3.79	102.31	672.68	35.88	9.90	15.54	197.00	15.54	3377.01	10.98
2016	622.29	18.12	4.20	102.48	728.62	36.01	10.09	13.62	305.00	13.68	3610.50	9.91

Appendix I

Lending Interest Rates

Year	Cote Devoir	Egypt	Ghana	Kenya	Malawi	Mauritius	Morocco	Namibia	Nigeria	South Africa	Uganda	Zambia
1996	0.77	15.58	34.49	33.78	45.33	20.81	11.75	19.16	19.83	19.52	20.29	53.78
1997	1.18	13.79	35.75	30.24	28.25	18.91	11.75	20.17	17.79	20.00	21.37	46.69
1998	1.59	13.01	32.04	29.49	37.66	19.91	13.50	20.71	18.18	21.79	20.86	31.80
1999	2.00	12.96	23.56	22.38	53.58	21.62	13.50	18.48	20.29	18.00	21.54	40.51
2000	2.41	13.21	28.60	22.33	53.12	20.77	13.31	15.27	21.27	14.50	22.91	38.80
2001	2.82	13.29	30.85	19.66	56.16	21.10	13.25	14.53	23.43	13.77	22.65	46.23
2002	3.23	13.79	16.20	18.45	50.54	21.00	13.12	13.83	24.77	15.75	19.09	45.19
2003	3.64	13.53	14.32	16.57	48.91	21.00	12.56	14.700	20.71	14.95	18.94	40.57
2004	4.05	13.37	13.62	12.53	36.83	21.00	11.50	11.38	19.18	11.29	20.60	30.72
2005	4.46	13.14	10.16	12.88	33.08	21.04	11.50	10.61	17.94	10.62	19.64	28.20
2006	4.87	12.60	8.88	13.63	32.25	21.08	11.50	11.18	16.90	11.16	18.69	23.15
2007	4.74	12.50	8.89	13.34	27.71	21.87	11.50	12.88	16.93	13.16	19.10	18.88
2008	4.78	12.32	11.28	14.01	25.27	11.54	11.50	13.73	15.47	15.12	20.45	19.06
2009	5.18	11.97	17.06	14.80	25.25	9.25	11.50	11.11	18.36	11.70	20.95	22.06
2010	5.29	11.00	12.87	14.37	24.62	8.87	11.50	9.72	17.58	9.83	20.17	20.91
2011	5.42	11.03	8.90	15.04	23.75	8.91	11.50	8.73	16.01	9.00	21.83	18.83
2012	5.08	12.00	10.05	19.72	32.32	8.66	11.50	8.65	16.79	8.75	26.15	12.14
2013	5.40	12.29	12.35	17.31	46.01	8.50	11.50	8.28	16.72	8.50	23.28	9.52
2014	5.29	11.70	12.90	16.51	44.28	8.50	11.50	8.69	16.54	9.12	21.58	11.57
2015	5.21	11.62	13.33	16.08	44.38	8.50	11.50	9.32	16.84	9.41	22.60	13.25
2016	5.60	13.61	13.77	16.55	44.11	8.50	11.50	9.86	16.86	10.45	23.88	15.50

Appendix J

Pooled Mean Group Estimates: DV=SMD

Variables	Coefficient	Std. Error	t-stat.	Prob>Z	95% Confidence interval	
RQ	1.098001	.3177732	3.46	0.001	.4751773	1.720825
BD	-.0110146	.0062436	-1.76	0.078	-.0232519	.0012227
LEP	.0418089	.0146812	2.85	0.004	.0130343	.0705836
PVR	1.151032	.3854225	2.99	0.003	.3956182	1.906447
UN	.0791029	.030848	2.56	0.010	.0186419	.1395639
EXG	.0125134	.0072576	1.72	0.085	-.0017113	.0267381
ER	.0032898	.0011252	2.92	0.003	.0010845	.0054951
IN	-.0528533	.0164528	-3.21	0.001	-.0851003	-.0206064
BRK	-1.335268	.3692746	-3.62	0.000	-2.059033	-.6115031
ECT	-.1505448	.06268	-2.40	0.016	-.2733954	-.0276942

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Appendix K

Pooled Mean Group Sensitivity Analysis Estimates

Variables	Coefficient	Std. Error	t-stat.	Prob>t	95% Conf. Interval	
RQ	.6258563	.1991177	3.14	0.002	0.2355927	1.0161
BD	-.005180	.0045764	-1.13	0.258	-0.014150	0.0037
LEP	.0297608	.0113644	2.62	0.009	0.0074869	0.0520
PVR	.879661	.2966777	2.97	0.003	0.2981834	1.4611
UN	.046084	.0211166	2.18	0.029	0.0046962	0.0874
EXG	.007517	.0062139	1.21	0.226	-0.004662	0.0196
ER	.0003806	.0002486	1.53	0.126	-0.000106	0.0008
IN	-.0305051	.010988	-2.78	0.005	-0.052041	-0.0089
BRK	-.8804025	.2485221	-3.54	0.000	-1.367497	-0.3933
ECT	-.1371276	.0609362	-2.25	0.024	-0.256560	-0.0176

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Appendix L

Principal Component Analysis for Stock Market Development

Component	Eigen value	Difference	Proportion	Cumulative
Comp 1	2.58	2.252	0.86	0.86
Comp 2	0.33	0.256	0.11	0.97
Comp 3	0.07		0.03	1.00

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